THE THIRTEENTH LACUS FORUM 1986

THE UNIVERSITY OF TEXAS AT ARLINGTON

THE THIRTEENTH

LACUS FORUM

1986

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THE THIRTEENTH LACUS FORUM 1986

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LINGUISTIC ASSOCIATION OF CANADA AND THE UNITED STATES
P.O.B. 101, Lake Bluff, Illinois, U.S.A. 60044

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FIRST EDITION

Published in Lake Bluff, Illinois, by LACUS, The Linguistic Association of Canada and the United States, P.O.B. 101, Lake Bluff, Illinois 60044 U.S.A.

Manufactured in the United States of America.

CONTENTS

Introduction ix

I. Special Lectures 1

1986 Presidential Address 3
Victor H. Yngve
TO BE A SCIENTIST 5

Inaugural Lecture 27
Kenneth Gregerson
PHARYNX ICONISM AS FIGURE AND GROUND 29

Invited Lecture 51
John Peter Maher
THE CULT OF WEAPONS IN ROCK ART
AND INDO-EUROPEAN LANGUAGES 53

1986 Presidents' Prize 91
Brenda H. Boerger
ON RECONSTRUCTING VOICED ASPIRATED STOPS
AND RETROFLEXED STOPS FOR PROTO-GYPSY 93

II. General Linguistics 103
1. *Edward L. Blansitt, Jr.*
TOWARDS A FUNCTIONAL-STRATIFICATIONAL
LINGUISTICS 105
2. *Mary W. J. Tay*
THEORETICAL MODELS FOR THE STUDY OF
NEW VARIETIES OF ENGLISH 115

III. Phonology and Scripts 125
3. *Toby D. Griffen*
SYMMETRY IN SWABIAN UMLAUT PATTERNS 127
4. *Miklós Kontra* and *Mária Gósy*
INTERFERENCE IN INTONATION:
NOTES ON HUNGARIAN-AMERICANS 136
5. *Jean-Pierre Y. Montreuil*
NUCLEUS ASSIGNMENT IN FRENCH
AND IN CATALAN 146
6. *Dale Savage*
SOME ABSTRACT FEATURES OF KWA
VOWEL HARMONY: AN AUTOSEGMENTAL
APPROACH TO ENGENNI, IBGO, AKAN, AND YORUBA 156
7. *George L. Huttar*
THE AFAKA SCRIPT:
AN INDIGENOUS CREOLE SYLLABARY 167

IV. Morphology and Syntax 179
8. *Ulf Bäcklund*
TOWARDS "PERFECTIVE" CO-TIME: A STUDY OF THE PROGRESSIVE IN ENGLISH 181
9. *Daniel Kies*
GRADIENCE IN ENGLISH GRAMMAR 199
10. *Michael Eric Bennett*
ISSUES IN CHOCTAW SYNTAX: (RELATIONAL GRAMMAR)-1 VS. (RELATIONAL GRAMMAR)-2 208
11. *Videa P. De Guzman*
INDIRECT OBJECTS IN SISWATI 217
12. *Marlin Leaders*
REALIS AND IRREALIS VERB MARKINGS IN MIDDLE WATUT OF PAPUA NEW GUINEA 227
13. *David G. Lockwood*
CLITICS IN A STRATIFICATIONAL MODEL OF LANGUAGE 236
14. *Velma B. Pickett*
CLITICS – TO BE OR NOT TO BE WORDS 246
15. *Diane Ringer Uber*
CONTEXTUAL DETERMINANTS OF THIRD-PERSON CLITIC USAGE IN SPANISH 254

V. Semantics 265
16. *Patrick Duffley*
THE MEANING OF *TO* BEFORE THE INFINITIVE 267
17. *Jean-Luc Garneau*
TRANSLATING ENGLISH EMPHASIS INTO FRENCH: A SEMEMIC APPROACH 275
18. *Lillian Huang*
THE SEMANTICS OF VERBAL COMPLEMENTS IN AMHARIC 286
19. *William J. Sullivan*
SIX TROUBLESOME SYNONYMS 302

VI. Discourse Studies 315
20. *Helen Dry*
THE EFFECT OF ITERATION AND CONTRAST ON TOPIC SALIENCE 317
21. *Shin Ja J. Hwang*
DISCOURSE FUNCTIONS OF SUBJECT AND TOPIC 327
22. *Carolyn G. Hartnett*
WORDS FOR DEVELOPMENT OF THINKING 339
23. *Carolyn E. Kent*
HELPING READERS DEVELOP STRATEGIES FOR EXPOSITORY TEXT 349
24. *Robert Koops*
THE LAYERING OF IMPLICATURE IN THE BOOK OF JOB 357
25. *Nathan Ménard*
ANALYSE STATISTIQUE DES PROPOSITIONS DANS UN TEXTE: PROBLEMES ET METHODES 368

VII. Computational Linguistics 379
26. *Robin P. Fawcett*
THE FORM OF A MINIMAL PROCEDURAL GRAMMAR: i.e. A GRAMMAR FOR NATURAL LANGUAGE INTERACTION WITH A COMPUTER 381
27. *Earl M. Herrick*
A COMPUTERIZED MODEL OF TRANSDUCTION 394
28. *Chang-in Lee*
MACHINE TRANSLATION: ENGLISH–KOREAN 410
29. *Michael Gasser*
DYNAMIC LEXICAL MEMORY 421
30. *Jonathan J Webster*
A COMPUTATIONAL MODEL FOR REPRESENTING WORD KNOWLEDGE 432
31. *Jonathan J Webster*
LEXI-PROCESSING WITH LOGO 443

VIII. Sociolinguistics, Psycholinguistics, Neurolinguistics 455
32. *Linda Laube Barnes*
AN INVESTIGATION OF GENDER-BIAS AND WRITTEN LANGUAGE 457
33. *Denise M. Neapolitan*
SEX DIFFERENCES IN BABY TALK: THE EFFECT OF LANGUAGE ENVIRONMENT ON COMMUNICATION AND COOPERATION 465
34. *Connie C. Eble*
THE SUBVERSIVENESS OF SLANG 477
35. *Kathleen Ferrara*
MORPHOLOGICAL EXPLANATIONS OF CHICANO WRITING NEEDS 483
36. *Thomas M. Stephens*
ON COMPOUNDING IN BRAZILIAN AND SPANISH AMERICAN RACIAL CATEGORIES 497
37. *Barbara Zurer Pearson*
A COGNITIVE BASIS OF METAPHOR 507
38. *Gary D. Prideaux*
PROCESSING STRATEGIES AS COUNTEREVIDENCE TO MENTAL MODULARITY 517
39. *Fred C. C. Peng*
AGRAMMATISM IN APHASIA: A CLARIFICATION IN LIGHT OF CHINESE APHASICS 524
40. *Leon E. Williamson*
LINGUISTICS: AN ACADEMIC FAMILY OF LANGUAGE STUDIES 535

IX. Historical Studies 549
41. *Saul Levin*
THE ROMANCE AND INDO-EUROPEAN MODELS OF COMPARATIVE LINGUISTICS 549
42. *Minoji Akimoto*
A VIEW OF IDIOM FORMATION 558

43. *Janet Duthie Collins*
THE WORD ORDER OF OLD ENGLISH POETRY 570
44. *H. Harwood Hess*
OLD ENGLISH SKEWING 581
45. *Carleton T. Hodge*
CONSONANT ABLAUT IN INDO-EUROPEAN 591
46. *Richard L. Morris*
AN ANALYSIS OF THE FUTURE TENSE IN THE EARLY GERMANIC LANGUAGES AS A MODAL CATEGORY 600

INTRODUCTION

The Thirteenth Forum of the Linguistic Association of Canada and the United States was held at the University of Texas at Arlington from August 12-16, 1986. The goodly number attending represented not only Canada and the United States but Japan, Singapore, Wales, Sweden, Hungary and Germany.

The sessions opened with a welcoming address by the President of the University, Wendell H. Nedderman, followed by the Inaugural Lecture by Kenneth J. Gregerson on 'Aspects of a Gestalt Linguistics.' The Presidential Address by Victor H. Yngve on 'To Be a Scientist' stimulated a lively discussion well into the evening following the banquet. The workshop evening included two workshops illustrating the use of computers in processing language data.

Something new was begun at the Forum which promises to be an exciting annual addition to the LACUS meetings. A Presidents' Prize was awarded for the paper judged to be the most significant contribution by a non-tenured professor or student. Brenda Boerger won this award, and her paper, 'On Reconstructing Voiced Aspirated Stops and Retroflexed Stops for Proto-Gypsy', has been included in the initial section of special lectures. Two others received honorable mention in the form of the Presidents' Commendation: Patrick Duffley for his paper 'The Meaning of *to* before the Infinitive' and Jonathan Webster for 'A Computational Model for Representing Word Knowledge'. The judging committee was composed of past and present presidents of LACUS.

The cooperation of many departments of the University helped to make this conference a success. The Department of Foreign Languages and Linguistics sponsored the initial registration reception, and their staff provided invaluable help both before and during the conference. This included sending out extra mailings of announcements and programs to the South Central area of the United States in both February and May. The Summer Institute of Linguistics provided the coffee break refreshments, transportation help for the airport runs and to places to eat. Tours were arranged for those wishing to visit the International Linguistics Center. The conference closed with an open house and dinner at the home of former LACUS President Kenneth and Evelyn Pike followed by an evening at a Texas Rodeo.

Ilah Fleming

I

SPECIAL LECTURES

1986 PRESIDENTIAL ADDRESS

TO BE A SCIENTIST

Victor H. Yngve

University of Chicago

One of the things that attracted me to linguistics thirty-five years ago was the realization that it dealt with a large area of natural phenomena not yet well understood that could be approached scientifically. It was a frontier with the challenge of the unknown. Linguists advertised their discipline as a science, and it did seem reasonable that there could be a linguistic science, for there were complex phenomena that could be observed, and the observations could be replicated. It reminded me of the complex phenomena in cosmic-ray physics that I had been working on, but it seemed more important and more interesting.

Then as I got into the discipline and started doing research, it came over me that linguistics had serious problems in regard to its scientific status. One of the first things I noticed was that much of the writing in linguistics was polemical. This was in stark contrast with the well-mannered writing that I had become accustomed to in physics. Furthermore, it developed that there were many different theories and points of view in linguistics, and the criteria for choosing among them were not clear. At first I thought it was simply because the discipline was not yet very highly developed, for physics, too, had been polemical in earlier centuries. The thing to do was to try to develop linguistics further as a science. So when I put forth a scientific hypothesis about the relation of phrase structure to temporary memory, I expected that linguists working on different languages would test it on the languages they studied, and some did and found that the hypothesis held. But the most vociferous reaction in this country was a polemical attack as if the hypothesis were a competing political ideology or religion. Some people were obviously not playing by the same rules that I had learned through my apprenticeship in science.

Believing that this was a temporary aberration in the discipline, I circulated a letter to some colleagues to see if I could get agreement on how to play the game -- on what constituted good scientific practice. The letter contained a hundred odd points elaborating on the conduct of scientific research as I understood it and on the ways in which some of the work appearing in the linguistics literature fell far short of even the minimum standards of scientific acceptability. The letter was responded to with apparent agreement by the linguists to whom I sent it. There may be some here who received it and responded.

I don't know what affect it may have had on the recipients, but this exercise helped me to be explicit about what I saw as serious problems in the discipline. It has helped to guide the conduct of my research, and it has served as a background for reading the history of linguistics and the history of science. I have also used these points in class from time to time, a few at the end of each period, and they have been taken up eagerly by the students, for they are brief and invite discussion and elaboration.

I have recently become convinced that the problem is not a temporary aberration, it is a growing cancer. Much that has occurred in linguistics in the last several decades has pulled the discipline in a direction opposite from science. A knowledge of what science is, and what it is to be a scientist, cannot, or can no longer, be taken for granted as part of the normal equipment of a trained linguist. So with the anticipated publication of my book Linguistics as a Science in November, it is appropriate that I also lay out in more detail what it is to be a scientist.

How does one learn to be a scientist? The answer is to study science under scientists. I would certainly encourage students contemplating a career in linguistics to take all the science they can get, for science is a way of life that is best learned by osmosis during an apprenticeship. It is a tradition that has been developed through trial and error by scientists over the last four hundred years or so. One learns about these things best by doing, and by studying under good teachers what others have done. Lacking such opportunities, one should read in the original the works of scientists, especially under the guidance of knowledgeable scientists. I would particularly recommend starting with the works of Galileo, which are quite readable in the English translations of Stillman Drake, and under the guidance of his essays on Galileo. These are particularly helpful, for linguistics today faces some of the same sorts of problems with philosophy, folk theory, authority, and entrenched opinion that physics faced in Galileo's time. Galileo wrote for a general audience, and he wrote clearly.

What I am publishing here may be of some help, especially if you get a chance to discuss the points with true scientists. You can look on these points as notes for an ethnographic report on the culture of science by someone who also has some acquaintance with the current linguistic culture and has tried to bring out some of the important contrasts. It is a report based on my education and socialization in science through three degrees in physics and while studying under some of the most illustrious physicists of their day.

Next a few words on the relation of philosophy to science. There is a literature on the philosophy of science that looks deceptively like a prescription for doing science. That is not

its purpose, however; its purpose is to investigate philosophical questions in epistemology and the theory of knowledge, not to teach science, and you will likely be misled. Different philosophers differ on what they think scientists are doing, and their writings are largely ignored by scientists, who take full responsibility for their own disciplines. At best these philosophers serve as critics, but one would not learn to play the violin from a music critic, no matter how insightful his comments might be.

Linguistics owes much to philosophy, for it was born of philosophy. But if linguistics is to be a science it must cut its ties to philosophy as the other sciences have done. This is rendered particularly difficult for linguistics because its basic theory has developed out of the ancient Stoic dialectic or theory of knowledge. As a result, linguistics is still very much dominated by philosophical concerns, which are detrimental to its development as a science. Chomsky's works, for example, are much more in the realm of philosophy than of science, as has been pointed out more than once in the literature. One can not expect to learn much about science from them; their influence has been to pull the discipline toward philosophy and away from science.

The biggest problem that a scientific linguistics has with philosophy, and the greatest danger that philosophy poses to the development of a scientific linguistics, is that philosophy is not science. The criteria of truth in philosophy are not the criteria of truth in science. The criteria of truth in science have been known and agreed upon by scientists for centuries: they are ultimately observations by the senses, for science studies phenomena in the physical domain. Philosophy, on the other hand, deals with the logical or metatheoretical domain where the criteria of truth have always been and still are controversial. Consider, for example, the continuing controversy over empiricism versus rationalism. So first, a would-be scientific linguist would do well to stay within science and not stray into philosophy for instruction in how to be a scientist. Learn your science from scientists, not from philosophers.

Second, and this would go without saying in science but becomes important for us in contrast to familiar patterns in linguistics: work in the.physical domain like other scientists rather than in the logical domain like philosophers. This means in the case of linguistics that we should study people, sound waves, and other linguistically relevant physical objects, rather than the convenient fictions of language, and we should seek a scientific understanding of how people communicate, rather than a scientific understanding of language, which, as I have shown elsewhere, is impossible.

After twenty years I have had to make only few changes in the following list of points. They have held up well, being a matter of tradition and checkable against scientists willing to serve as

informants. I should add that probably no scientist is such a paragon that he always lives up to all the ideals presented here, but if he is a good scientist, he tries his best to do just that.

A. What is Science?

A1. Origin of Science

Science probably has its origin in curiosity about the environment, a trait that man seems to share with many other species of animals.

A2. Adaptive Mechanism

The ability of an organism to ascertain regularities in the environment and to predict events on the basis of the regularities is an adaptive mechanism and has survival value. It is not difficult to think of clear examples where a knowledge of the environment obtained through curiosity would save a person's life.

A3. Control of Environment

Knowledge of the environment and an ability to predict has made it more and more possible to control the environment. The possibility of controlling the environment has provided an additional motive for pursuing knowledge. Application of knowledge to problems of controlling the environment is not, however, included in science as I am using the term.

A4. Search for Knowledge

Science is concerned with a search for knowledge -- to know the unknown -- to discover new regularities in the environment that can be relied upon as a basis for prediction.

A5. Sophisticated Common Sense

It has been said that science is only sophisticated common sense. I take it that by common sense is meant the ability that most people have of predicting events in their everyday lives on the basis of ascertained regularities in the environment, and of acting in a rational way on the basis of the predictions. Science, however, is concerned more with understanding the regularities in the environment than on taking rational action, and in this it differs from technology, which uses the knowledge obtained by science and applies it to practical ends.

A6. Regularities

Science places an emphasis on a systematic explanation of similarities and underlying unity as a solid basis for predictions. In this it differs from the arts, where emphasis is more often placed on the unique differences that constitute aesthetic qualities, and where it is often said that artistic interest lies

in unpredictable deviations from the commonplace or from the norm.

A7. Science and the Humanities

It is sometimes alleged that science and the humanities are incompatible. This is not true for linguistics, however, which is in the humanities on the basis of its subject matter and in the sciences on the basis of its methods.

A8. Classification of Science

The partitioning of science into separate disciplines is for convenience and division of effort only. As science advances, some of the most interesting research takes place at the borders between separate disciplines as conceived in terms of an older classification.

A9. Universality

There is no place for parochialism in science. Specialization and division of labor are, of course, useful. But the various parts of science are interconnected and no area of science should try to cut itself off from the rest.

A10. Linguistics as Part of Science

If linguistics is science, it is not isolated and autonomous, but part of science. The conception here is that there is only one science, and the various parts of it are interconnected and relevant to various different phenomena. It is important to emphasize this unity and interconnectedness because there are many well established results in science that bear on linguistic phenomena in important ways.

A11. One Science

There is and can only be one science. There cannot be competing sciences built on different principles. Thus if linguistics is part of science, there can only be one linguistics, a scientific linguistics. This in not to say that there couldn't be competing tentative scientific theories concerned with the same observations.

A12. A Program.

Science is not an _ism_. It is a program. It is a program aimed at trying to get as close to the truth about nature as possible. This search requires that one keep an open mind, for one doesn't know ahead of time where the truth may be found. _Isms_ imply prior commitments which can only get in the way of doing good science. For the last 150 to 200 years linguists have been scientists to some extent. This modern era in the history of linguistics can be read as a struggle between the science of the future and the _isms_ of the past. The abandoning of prescriptivism is but one example.

A13. Regularity in Nature

The scientist believes, or accepts as a reasonable working hypothesis, that nature is regular and capable of being investigated, that there are regular phenomena for us to observe, describe, and to understand. But our theories and hypotheses will always be tentative. One could enter here into a philosophical discussion as to whether this regularity is or is not imposed upon nature by its observers. Nevertheless, the ability to predict what will happen tomorrow is based on observed regularities from the past and the belief that these regularities will continue into the future.

A14. Role of Belief

The role of belief in science is a minor one. A scientist tries to operate with very few beliefs or articles of faith in the realm of science. He does, of course, believe many things in science, but his basis for believing them is not ultimate belief or faith. He knows that knowledge obtained through science is tentative. In any context certain things are accepted (believed) but in appropriate contexts they can be challenged.

A15. Revelation

There is no place in science for revelation or the revealed truth. Belief and revelation belong in the realm of religion, and are outside of science.

A16. Rejection of the Supernatural

Science rejects the occult and the supernatural because no convincing scientific evidence has been provided for accepting them. Magic, superstition, and the mystical are rejected as means for ascertaining or expressing regularities in the environment and predicting events.

A17. Cults

There is no place in science for fervor, sectarianism, discipleship, orthodoxy, conversion, proselytizing, or propaganda. Different points of view confront each other in objective discussion.

B. A Scientist's Choice of Direction

B1. Goals not Absolute

The validity of a scientist's goals and the intrinsic interest of a line of work or results are not absolute, but relative to a frame of reference. Often this frame of reference is some current theoretical question, or some current incompletely understood set of observations.

B2. Divergent Goals

There is the possibility of valid but apparently conflicting goals in a line of scientific research. Any effort expended in arguing about which goal is better or "right" would be wasted, for it is often the case that the knowledge obtained while pursuing one goal turns out to be very relevant to another. A scientist should be free to choose his own goals.

B3. Not a Fad

The validity of a scientist's goals and the interest of a line of work or results is not a matter of fad or vogue. It is true that many of the results in science take place at what may be called a forefront. When certain results become available, certain other work is the natural next step. Therefore there tends to be a natural accumulation of workers in specific areas on the forefront, but if they are scientists or aspiring scientists, they are not there because it is a current fad, but because they feel they can learn more in an area that is rapidly opening up.

B4. Don't Fence Me In

A scientist refuses to be fenced in by a narrow definition of a discipline. If the pursuit of scientific knowledge takes him outside of his area of competence, he will try to interest other scientists in taking up the pursuit, or he may prepare himself in the new area, and go after it himself.

B5. Pursuit of Truth

A scientist shows a willingness to pursue truth wherever it might lead, and his pursuit is relentless.

B6. A Questioning Mind

The scientist is always asking questions and trying to answer them. He actively looks for questions to ask. Perhaps one of the most tragic event in the lives of some children is when their natural curiosity is squelched.

B7. Meaningless Questions

The scientist refuses to ask meaningless questions, and feels that it is important to examine the questions he is asking to see if they are meaningful or not. A meaningless question is one that might seem reasonable at first, but on adequate examination it would turn out to be incapable in principle of being answered. Often the fact that a question is meaningless is quite obscure, and sometimes considerable scientific progress results from recognizing that a question on which much effort has been spent is in fact meaningless, and thus incapable in principle of resolution. The question of how people use language to communicate, which I was asking in 1969, seemed reasonable, but on closer examination it has turned out to be meaningless.

B8. Clarification

When it is discovered that a question, posed in all seriousness, is actually meaningless, an attempt is made to revise and restate it and to put it into meaningful form. A revised and meaningful question is, How do people communicate?

C. The Methods of Science

C1. Democracy

Scientific truth is not arrived at by vote or consensus. Democracy has its place in public life and in the management of scientific institutions and universities, but scientific truth is arrived at by scientific means, not by voting. It is true that observations and theories get accepted or rejected by the scientific community, but there is a higher tribunal, so to speak, than the vote or consensus of scientists. The history of science is full of cases where the respected majority of scientists was wrong, and the scorned minority right.

C2. Authority

Knowledge is not accepted on ultimate authority. Again there is a higher tribunal. It is true that much of what we know we individually accept on authority, but in science there is always the possibility of appeal at any point to the ultimate test against observational evidence, which is open to anyone. Scientists are suspicious of pronouncements put forth with an air of authority.

C3. Observation

Science is grounded in observation, and all scientific knowledge must submit to tests based on careful observation.

C4. Analysis

Scientific progress and understanding is based on the use of reason. All scientific knowledge comes about through observational evidence and reasoning from that evidence.

C5. Balance

There is a delicate interplay between observation and theory. A proper understanding of this interplay, and an appreciation of its importance, is required of every scientist, so that a proper balance may be maintained between the two.

C6. Gambling

In the conduct of scientific research, the hunches of the investigators play an important role. Since science is pursuit of the unknown, the scientist cannot know completely, ahead of time, what he will find out. Thus research must, by its very nature, be

a gamble. Some research efforts are relatively sure fire, whereas others are long shots. Successful scientists are those that have the best hunches, often based on a well-developed intuition of what there might be to find out. A scientific hunch is an educated guess. The role of luck may be as important as it is in other forms of gambling. A scientist is not to be derided if he loses a gamble in research.

D. Observation

D1. Pure Observation

Some observations are the result of general exploration, as when a botanist arrives on a new island, or a linguist comes upon a new language. However, all observation is based on theories at a lower level, which influence the way in which the sense impressions of the observer are organized into observations.

D2. Collection of Data

An important activity in science is the collection of data, as when a botanist collects specimens, or the linguist collects texts and notebooks full of informant responses.

D3. Classification

Data collected are often given a preliminary classification on the basis of lower level theories, or on the basis of other convenient criteria that suggest themselves. This classification is of course tentative and for convenience in handling the data.

D4. Experimental Method

Here is where observation makes contact with theory. The predictions of theories are compared systematically with observations. This systematic comparison is called experimentation.

E. Techniques of Experimentation

E1. Experiments Suggested by Theory

A theory that properly accounts for some observations will predict the possible results of other observations. Experiments are then performed to see if the predictions of the theory are confirmed. Thus the theory is put to the test of observation.

E2. Nature of Data

Data taken as a result of observations are always correct, except for instrumental malfunction and simple mistakes in reading. The problem comes in knowing which of the conditions under which the observations were taken are relevant for their interpretation. It is hoped that some of the conditions are relevant and

the data are significant. But the data, whether they are significant or not, are correct for the given conditions.

E3. Honesty

Data are not to be disregarded in favor of some theory. A theory predicts what one expects to find if the theory is correct, but it cannot be used for deciding whether the data are appropriate or whether they are correct, for data thus tampered with or fudged cannot be trusted to shed light on the validity of the theory.

E4. Meticulous Care

Great care is taken in collecting data to eliminate mistakes, instrumental errors, and other interfering influences.

E5. Personal Bias

The scientist tries to remove all personal biases, since they may warp his judgment and get in the way of determining the scientific truth. Precautions are often taken to eliminate unintended personal bias through such means as double blind experiments.

E6. Detachment

And the scientist habitually stands in the background so as to remain objective and remove himself and his prejudices as much as possible from the research.

E7. Reproducibility

The scientist is most confident in his data when he can reproduce his observations at will. Thus he will repeat experiments to assure himself that the data can be trusted.

E8. Control of Variables

An effort is made in doing experiments to eliminate all the variables except the ones under observation. This is often very difficult and sometimes involves considerable auxiliary experimentation or the use of statistical techniques in order to discover what all the extraneous variables are or how to keep them constant or eliminate their effect on the results.

E9. Sources of Error

When data are reported, they are always accompanied by a careful examination and assessing of the possible sources of error. The experimenter is in the best position to know to what extent the data can be trusted, and it is up to him to report a realistic and honest assessing of the potential errors. In this he tries to be cautious, for he knows that he may be overly optimistic in assessing the accuracy of the data. He knows he may have overlooked errors due to his ignorance of additional variables not brought under control.

E10. Game

Many scientists even talk as if they were playing a game with Nature, trying to wrest her secrets from her, while Nature tries her best to conceal her secrets and to delude the scientist with counterfeits. In other words, the scientist should regard his discoveries with suspicion as possible delusions.

E11. Comparison with Theory

When an experiment has been completed, the resulting data are analyzed and carefully compared with the predictions of theory. In this way light is shed on the validity of the theory in question. All discrepancies must ultimately be accounted for in terms of experimental error or uncontrolled variables, or on the basis of inadequate theory or inappropriate application of the theory.

F. Theory

F1. Stem from Observation

Theories are suggested ultimately by observations, since it is their purpose to express regularities in the environment and to predict events on this basis.

F2. Hunch

Theories often start out on the basis of a hunch or guess concerning what may lie behind certain observations.

F3. From Inadequacies

Theories are often suggested by older theories and their particular inadequacies in handling certain experimental results. Sometimes these experimental results were not at hand when the older theories were developed.

F4. Inference

The processes of inference and induction in working out the first steps of a theory are very sketchy and approximate. The scientist here works intuitively. He may use rough analogies.

F5. Theory Building

As the theory takes shape, decisions are made as to how to generalize from other theories and from observations. It is not necessary that a theory have an a priori or principled basis that can be defended as independently valid, and it is a mistake to search for one. The validity of a theory is tested in other ways.

F6. Simplicity

There is nothing mystical or a priori about simplicity. The need for simplicity in science stems from the the need of man to

be able to predict reliably as large a range of phenomena as possible with his limited mental capabilities. Some phenomena are complex and require a complex theory for their explanation. Practically never are we in a position to compare two theories that deal equally with observation, and differ only in simplicity, and when theories differ in respects other than simplicity, these other respects are nearly always the controlling factors in acceptance or rejection.

F7. Limits of the Theory

It is often expedient to push a theory to the very limit and beyond in order to find that limit. In so doing, a theory may be pushed into territory that it does not economically handle. Later theories may push back and regain some of the ground.

F8. Taxonomy

A proper theory separates phenomena that are different and puts together phenomena that are the same. In this sense all theories are taxonomic. A taxonomy may also be predictive if it contains open positions that it predicts will be filled.

F9. Experimental Method

When a theory is ready, it is in the form of an hypothesis which can be checked by means of observation and experiment. A theory which cannot be compared with observation cannot be tested and cannot be proved wrong. It cannot become part of science and should at best be considered as speculation. Perhaps new methods will make a test of the theory possible in the future.

G. Techniques of Theory Development

G1. Deduction and Prediction

In order to test a theory against observation, it is necessary to draw predictions from it. This is done by a process of reasoning, often formal or mathematical in nature. The utility of formalism in theory is for ease in drawing predictions, not for comparison with any a priori principles.

G2. Details of Prediction

When predictions are drawn from a theory, it is important to know in detail how each specific prediction of the theory is related to the structure of the theory as a whole. In this way it will become clear for each prediction what the consequences of its not being borne out would have for the theory.

G3. Check Against Observation

The specific predictions of a theory can then be compared with a large body of observations if these are available. This is

the first careful check of the theory.

G4. Experiments

A theory generally predicts the results of certain observations which have not yet been made, and in this sense a theory suggests experiments. The results of such experiments can be used to shed light on the correctness of the theory. If two credible theories predict different outcomes for a particular experiment, this experiment assumes the role of a crucial experiment, and is often interpreted as favoring one theory over the other, although neither may turn out to be correct in the end.

G5. Evidence

Often the evidence of experiment is only indirect. Sometimes the evidence bears on a point that is predicted by nearly all theories in the field. Sometimes the line of reasoning from the evidence to the theory requires additional experimental links that have not yet been closed.

G6. Substantiation and Rejection

Favorable experimental evidence for a theory only tends to substantiate the theory, but unfavorable evidence can cause a theory to be rejected in whole or in part. Sometimes the theory can be kept but amended.

G7. Tentativeness of Theories

No theory is ever established as the ultimate truth. Theories, by their nature, are all tentative. For this reason the scientist is a professional fence-sitter. It has often happened in science that the most strongly held theories have toppled.

G8. Nonuniqueness

It is possible to have more than one valid theory of the same phenomena. An outstanding example of this in physics is thermodynamics and statistical mechanics. A wide range of phenomena is accounted for by both, and each accounts for the phenomena differently from the other. But the theories do not contradict each other: there are certain reduction relations between them.

H. Role of Mathematics in Science

H1. Mathematics as a Tool

The major role of mathematics in science is as a tool or language in which theories can be stated and in which deductions from them can be drawn to be compared with observation. Under mathematics in this sense we must include logic and formal reasoning of all kinds. Informal reasoning is also commonly used at

many places in theory building and in comparisons with experiments.

H2. Appropriateness

When deductions are made from a theory for comparison with experiment, the appropriateness of the mathematics and logic used must be examined. If the theory predicts correctly, the appropriateness of the calculations used in this instance tends to be substantiated along with the theory.

H3. Pseudomathematics

A competent scientist does not pepper his manuscripts with mathematical notations that serve no good purpose in computation or exposition. Mathematical notation is not to be used as window dressing.

H4. Innovations in Mathematics

Often the needs of a particular scientific theory can only be met by the invention of new methods in mathematics. These new methods may lack the rigor of the more carefully worked out areas of mathematics, but work perfectly well in the particular scientific application. They are often cleaned up later by mathematicians and made more general and more rigorous. Sometimes whole branches of mathematics have their origins in the needs of a particular scientific theory.

H5. New Applications

It is sometimes the case that a branch of mathematics investigated for its own sake is later applied in science in a way that could not have been foreseen at the time of its development. It offers a mode of reasoning appropriate to the new subject matter.

H6. Role of Statistics

Most of our basic theories are not statistical in nature. Often, however, the difficulties of observation, either inherent or due to unknown interfering effects, prevent an exact comparison of theory with experiment. In such cases statistics are often used to average over the interfering phenomena. We give up the possibility of exact prediction of all details and gain an ability to predict averages, which often can be compared directly with observation.

H7. Role of A Priori

While the role of a priori is very substantial in mathematics and logic, it has no direct application in science. A scientific theory, or any of its parts, are not required to have any a priori truth or justification. Their truth can only be investigated by means of comparison with observations and experiments which would tend to confirm or to disconfirm the theory as a whole or in part.

H8. Pure Mathematics

Although much of scientific theory is couched in mathematical terms, mathematics itself is outside of science, as we have been using the term. Mathematics and logic are based on the a priori and on arbitrary but interesting definitions. They are in the logical domain and thus are not subject to comparison with experiment or observation.

H9. An Inappropriate Model for Linguistics

A linguistics conceived on the model of mathematics or logic, and therefore not subject to comparison with experiment or observation, would not be part of science. It would not have contact with reality, and any relationship to linguistic phenomena would be speculative at best, for it could not be tested.

I. Scientific Knowledge and the Community of Scientists

I1. A Cooperative Venture

Science advances by means of an accumulation of knowledge as a community or cooperative venture of scientists.

I2. Scholarship

A scientist requires knowledge of prior work. This he may obtain through scholarship. There is a very important role of education in science. The tradition is thus handed on and continually reexamined.

I3. Reproducible Experimental Results

Science involves the building of a tradition that includes a body of accepted reproducible experimental results. These results accumulate by accretion, and have to be accounted for by theory. They must be reproducible so that if they are ever brought into question, they can be checked. They are in fact brought into question and checked whenever any doubts arise. Of course some observations can, unfortunately, never be checked because the occasion is lost in history. If this is the case, the best we can do is to try to assess the amount of confidence we can have in the observations and in any conclusions based on them.

I4. Accepted but Tentative Theory

Science involves the building of a body of accepted but tentative theory. Since theories can never be completely validated, they must always be tentative. However, a tentative theory can be accepted as the basis for building additional theory and as a basis for suggesting experiments.

I5. Progress

Progress in science requires attempting to reconcile con-

flicting evidence and conflicting theories, often by improvements in theory and in experiment.

I6. Limitations of Theory

In science it is imperative that there be full knowledge of and discussion of the limitations of current theory. Such discussion should not be construed as attacks on the theory or its inventor. It is appropriately initiated by the inventor himself.

I7. Discrepancies

When discrepancies are discovered between different theories, between different observations, or between theories and observations, the way may be opened up to achieve new insights. Such discrepancies are to be viewed as opportunities and not an occasion for polemics.

I8. Presentation

In presenting the results of a scientific investigation, facts and theories should speak for themselves. No argument for them should be brought forward that is irrelevant to the way in which they have been arrived at or could be judged.

I9. Advocacy

The scientist is a searcher for knowledge, not an advocate of a position, like a lawyer before a judge or a jury. In science it is presumed that all scientists are on the same side, that is, the side of trying to find out the truth about the phenomena in question; whereas in law the presumption is that there are adversaries, each with a personal stake in a different outcome. This point of view is foreign to science.

I10. Polemics

Polemics and prowess in argument and disputation do not settle questions in science or prove a view to be right or wrong. Scientific truth is arrived at not by argument, but by reasoning from the evidence.

I11. Character Assassination

There is no room in science for character assassination. A scientist, in his publications and private utterances, keeps his eye on the subject matter and the cooperative venture of arriving at scientific truth.

I12. Means to an End

The burden of building and maintaining this body of knowledge falls mainly on publication by scientists and accumulation of publications in libraries. The importance of libraries in storing the information and arranging for easy and convenient access to it cannot be overemphasized.

J. Publication

J1. Purpose of Publication

The purpose of publication is to add to the available knowledge in such a way that other scientists can make use of it.

J2. Open Publication

It is important for the advancement of science that results be published in an open manner so that they are available to all other scientists. The burying of important results in manuscript form, or leaving them as rough notes or as tentative reports to sponsors, act to impede the unrestricted flow of scientific information. Likewise, the restricting of results to employees of one company or citizens of one country is to be deplored. The cooperative effort necessary for scientific progress cannot flourish if unnatural barriers to information flow are erected.

J3. Prompt Publication

It is important, when a piece of scientific research is finished, that it be reported promptly. Delays in the publication of important results impede scientific progress and tend to foster duplication of effort.

J4. Complete Publication

When a piece of research is published, it should be published in complete enough form so that the work can be repeated and verified by others.

J5. Responsible Publication

It is important that the scientist refrain from publishing prematurely, carelessly, or repetitiously. Sloppy scientific publication wastes the valuable time of the more competent workers by competing for their attention against more worthwhile activities, and by introducing misinformation into the literature that could impede our future understanding.

J6. Honest Publication

It is important that standards of honesty, truthfulness, and accuracy in publication be of the very highest. A piece of work is of no use if it is suspected that it has been put forth with less than complete honesty, truthfulness, and accuracy, for other scientists would hesitate to use the results until they had verified them themselves.

J7. Sources of Errors

It is important that a publication include a careful reporting of all discrepancies, doubts, and sources of error remaining after all due care has been taken. The scientist who did the research is in the best position to assess the sources of error

and it is incumbent upon him to report them clearly and honestly.

J8. Fair Publication

Authors would do well to give credence to the possibility of conflicting theories or experimental results. They should present a fair discussion of the pros and the cons.

J9. Credits

All publications should contain careful and honest citation of prior work so that due credit is given to other investigators.

J10. References

For the benefit of future students and researchers, bibliographic references should be given for important citations. It should be possible for a person who becomes interested in the work to follow back through the references and uncover all the important prior work on this point. The references should ultimately lead back to initial or basic papers.

J11. Who to Cite

Citations and references should be chosen on the basis of their relevance to the subject matter for readers of the work at hand, not on the basis of personal considerations of the author. Citations are not to be used as impressive window dressing, as symbols of solidarity with a group, as salutes of allegiance to a leader or a movement, or as patronage for one's friends; and the exclusion of relevant citations should not be used as ammunition in a war between opposing camps.

J12. Advertising

The purpose of publication is not for advertising a particular theory, a particular group or school, or any other entity.

J13. Personal Aggrandizement

The purpose of publication is not to build personal reputations.

J14. Built-in Conflicts

There is the possibility of conflicts within the individual scientist because his personal advancement often depends strongly upon the research that he has done and therefore upon his publications. Thus each scientist tends to find himself in a position where personal considerations might conflict with the requirements of science and scholarship. The scientist resolves these conflicts in favor of science.

K. Terminology

K1. Careful Use of Terms

It is important that terminology be used carefully for the purposes of communication, and to carry accepted meanings.

K2. Change in Terminology

Terminology should not be changed needlessly. This can only introduce confusion. The development of agreed-upon terminology is part of the community effort in science.

K3. Banners, Badges, or Trademarks

Words should not be used as banners, badges, or trademarks to indicate allegiance to a particular point of view or school, or for empire building. Neither should unfavorable allusions be added to words to make them into weapons to hurl against other scientists. Such use of words removes the author from the cooperative endeavor of science, and puts him into a position of advocacy of special interests.

K4. Narrow Definitions

A scientist will not insist that his narrow and egocentric area of interest be used to define the scope of a broad field such as linguistics, and then use this definition as a club in argument, claiming that his adversaries are not linguists. Such usage again removes the author from the community of science.

L. Personal Characteristics

The scientist therefore cultivates the following personal virtues, among others:

L1. Inquiring Mind

A scientist will cultivate an inquiring mind and will actively seek out new sources of data and new questions to ask.

L2. Competence

A scientist will try to develop his competence as an investigator, and not be satisfied with mediocrity in his own performance as a scientist.

L3. Pride of craftsmanship

The scientist takes pride in craftsmanship -- in doing the best job that he is capable of. He does not go to the extreme, however, of worrying unduly and protractedly over minor and petty details that are clearly not relevant to the scientific and scholarly quality of his work.

L4. Scholarship

The scientist maintains contact with the intellectual tradition in his field. He makes it his business to know what has been done. He is careful to achieve a thorough understanding of the prior work and to assess it on its merits. He distrusts secondary sources.

L5. Open-Mindedness

The scientist tries to maintain an open mind, and is ever ready to entertain new ideas and new theories. He is tolerant of new approaches, and realizes that a diversity of backgrounds among scientists in a given discipline can be the source of great strength.

L6. Colleagueship

The scientist is a good colleague of other scientists. He considers them to be his teammates, playing in a game with the only adversary being Nature and her secrets.

L7. Intellectual Honesty

A scientist develops intellectual honesty and personal integrity. These he makes habits not only in his scientific work, but also in his personal life, believing that there can be no compromise in these matters.

L8. Perseverance

A scientist will cultivate an ability to push an idea that shows promise as far as necessary, even in the face of great discouragement, but he maintains an ability to know how far to push an idea and when to drop it. This takes finesse because good ideas should be pushed to completion and bad ideas should be dropped as soon as possible. Often it is not known at the outset whether an idea is good or bad.

L9. Modesty

The scientist is fully aware that his work may turn out to be wrong in spite of his best efforts. He therefore puts it forth with all due modesty.

L10. Arrogance

Arrogance is out of place in a scientist, since it tends to commit him emotionally to the position he is currently holding, and makes it more difficult for him to change as progress is made. Excessive arrogance may lead to the personal domination of other scientists with a resulting constricting and inhibiting effect.

L11. The Right to Be Wrong

A scientist does not cling stubbornly to an idea that proves

to be wrong, and he grants to other scientists the right to have been wrong. He knows that science can only advance by means of change and improvement in theory and observation. What is right on the basis of current evidence may turn out to be wrong when additional evidence is in. Some of the world's greatest scientists have been wrong and it does not detract from their stature.

Finally, this last point is perhaps central to why there can be no isms in science.

L12. Personal Responsibility

A scientist assumes personal responsibility for the work that he chooses to do and for the decisions as to what theories he will tentatively accept and what methods he will use. In these matters he does not bow to external authority or to scientifically irrelevant considerations, as his personal scientific integrity is at stake. And, as we have seen in earlier points, he applies scientific criteria in deciding what to believe. This idea of personal responsibility and the application of scientific criteria of truth is the reason that science, in the long run, converges on agreement as to the best current tentative understanding of nature.

INAUGURAL LECTURE

PHARYNX ICONISM AS FIGURE AND GROUND

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1. Introduction

In the study of language it is, in some sense, true, as the ancient Preacher of Ecclesiates rather pessimistically put it, that: 'there is nothing new under the sun!' On the other hand, it is also true that in the fortuitous flow of events the juxtaposition of some not-so-new things can create some new combinations. And it is just this kaleidoscopic effect that continues to tease us on in search of further novel patterns in language.

This paper reflects in the above sense the coming together of interests from the following independent directions:

Iconism
Gestalt notions of figure and ground
Pharyngeal effects in language

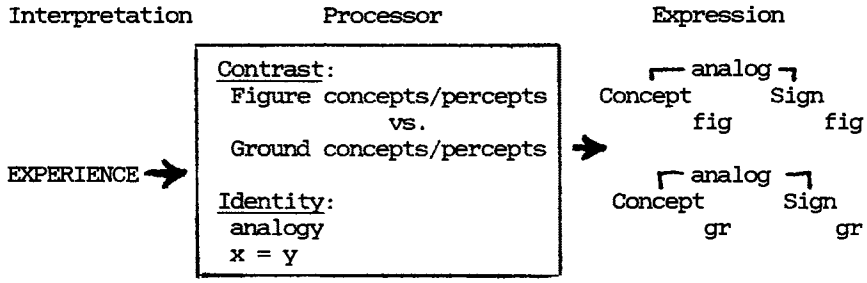
Each of these topics has in recent years enjoyed a re-birth of interest on the part of linguists and other social scientists. I will not here attempt, however, any general bibliography.

Perhaps a brief characterization of each of the above topics is in order before going into detail. First of all, **Iconism** is here equivalent to the sound (phonetic) symbolism of, for example, Sapir 1929. (For a convenient historical summary of some high points in this area, see Jakobson and Waugh, 1979). The term 'iconism' itself is, of course, due to Pierce (1931) and denotes the motivated relationship between a sign and its referent, such that the former reflects by some analog in its physical form a corresponding conceptual feature of the latter.

Figure and **ground** are used in the familiar Gestalt psychology sense of a distinction between bordered, bounded, and consolidated phenomena as opposed to the perceptually unbounded, extended and dispersed. That is,

G R O U N D
vs.
FIGURE

These concepts of **iconism** (analogy) and **figure** vs. **ground** come together, for I assume that something like the following schema obtains for a significant subset of human perceptual/conceptual and expressional linkages:



That is, a Processor (classically a human) accepts through appropriate channels the sense data of its experiential world, which it interprets either in terms of **identity** between objects or in terms of **contrast** between object and background or between two objects. Then when conceptual objects are expressed, they may be conveyed via a sign with an analogous degree of extendedness (i.e. bounded figures vs. unbounded ground) implemented in whatever medium the sign form takes.

In what follows I explore some familiar concepts that may be distinguished as figural vs. groundish and the phonetic sign forms that seem to be physically mirroring these notions by being somehow correspondingly figural and groundish.

Pharyngeal effects in language, as referred to, above involve the major articulatory gestures of advancing or retracting the tongue body to create varying pharyngeal and oral cavity volumes. In the nature of things these basic movements are associated in a very natural way with certain other phonetic functions.

The constellation of phonetic features that I wish to explore briefly here are those described in Henderson, 1952, for Khmer and generalized for certain other Mon-Khmer languages in Gregerson 1976. My restatement of Henderson to include pharynx width for the two phonation ('register') types in Khmer is as follows:

KHMER PHONATION TYPES

	Initial (written) Consonant	Voice Quality	Vowel Quality	Pitch
First Register	voiceless (original)	clear, tense	open, RTR	higher
Second Register	voiced (original)	lax, breathy	close, ATR	lower, larynx low

That is, two phonation types (prosodies) classify all syllables in Khmer such that the originally **voiceless** initial ('first register') syllables have **'clearer', 'tenser voice quality** and take **vowels** of a **more open, Retracted Tongue Root (RTR)** variety and **higher pitch**. By contrast, the old **voiced** initial ('second

register') syllables were **breathy**, with **close, Advanced Tongue Root (ATR)** vowels on a **lower pitch.**

In the following sections I wish to illustrate that the contrastive phonetic features which cluster with each of the above phonation types in Mon-Khmer languages of Southeast Asia are also recruitable for contrastive iconic functions in language generally. The major feature I treat is **pharynx width**, since it is virtually undescribed as to iconic function in the literature. I illustrate more briefly the other associated phonetic features involved in parallel iconic roles.

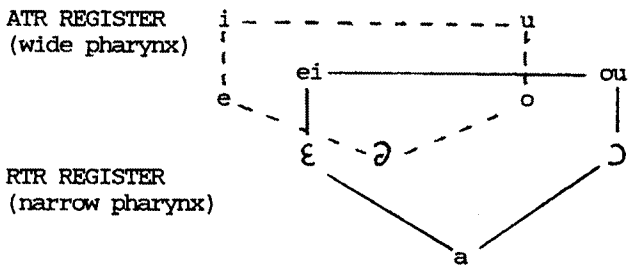
2. Evidence from Ideophones

2.1 Rengao (Mon-Khmer) Ideophones.

Rengao, a North Bahnaric language of Vietnam, is characterized phonologically by a register contrast similar to that cited above for Khmer. Its most dramatic implementation of these two phonation types involves ATR (higher, breathy) vowels vs. RTR (lower, clear) vowels. The following garden variety contrasts are illusrative (see Gregerson 1984 for a fuller treatment):

ATR (breathy) vowels		RTR (clear) vowels	
kədri	'wife'	kədrei	'thunder'
ñen	'we (excl)'	ñɛn	'to see'
təng	'ponder'	tang	'substitute'
brok	'go'	brɔk	'instrmt'
tuh	'to water'	touh	'to hit'

Schematically, the vowel sets may be represented as follows:



Thus, vowels in both ATR and RTR sets reflect the expected front vs. back and high vs. low features. However, in addition, and importantly, the ATR vowels are higher and generally more fronted than the RTR vowels. This is true for the sets as a whole and for each counterpart pairwise between the two sets (e.g. ə̲ is higher/fronter than a̲, etc.).

Now, beyond their normal phonological service as arbitrary signs available for the usual sorts of lexical contrast (e.g. tə̲ng

vs.tang above), these vowels function in an elaborate system of **ideophones** according to the following analogical **principle of extendedness**:

$$E_c = E_f$$

in which Extendedness of Concept (Ec) is associated with an Extendedness of Form (Ef). Specifically:

Extended (large) referent = Extended speech cavity
Bounded (small) referent = Bounded speech cavity

Consider first the following ideophone pairs involving **oral cavity** size contrasts (front-back, high-low):

Front/back	DIM/AUG
tabrɛn/tabrɔn	'very small/small pattern'
prɛw/praw	'very tightly/tightly woven'
təplip/təplup	'very short/short plump person'
ragɛw/ragaw	'very skinny/skinny person'
rəhik/rəhuk	'small/large nose'
chahɛh/chahɔh	'small/large lips'
tagɛk/tagak	'small/large hole'

High/low	DIM/AUG
tahrouy/tahrɔy	'small/large group (sg file)'
qbri/qbre	'small/large red object'
rəhik/rəhek	'small/large nose'
chəhuh/chəhoh	'small/large mouth'
təbluy/təbloy	'small/large sphere' (pumpkin/moon)

The forms above reflect the familiar sound symbolic use of **front** (small oral cavity) **vowels** to model **diminutive** (DIM) referents and **back** (large oral cavity) vowels for **augmentative** (AUG) ones. Thus tabrɛn connotes a smaller patterned object than tabrɔn. Similarly **higher** vowels are iconic of **smaller** referents than **lower** vowels, (again an **oral cavity** symbolism), e.g. tahrouy involves a smaller group than tahrɔy.

The pattern of ideophone iconism that emerges in a full analysis of Rengao, however, reveals that **not only oral** but also **pharyngeal cavity size variation** is systematically employed to distinguish DIM from AUG ideophones, for example:

RTR/ATR(brɔng/brong)	DIM/AUG
ei/i	
qbrei/qbri	'small/larger red object'
kaweik/kəwik	'small/large creature crawling'
ɛ/e	
taqɛ/tə̧qe	'small/large hand'
taqyɛng/təqyeng	'small/large billowing obj' (skirt/parachute)
a/ə	
chagra/chəgrə	'small/large prone body'
tapaw/təpəw	'small/large person crouching'
ɔ/o	
hahrɔt/həhrot	'small/large man running'
rahɔq/rəhoq	'small/broken tooth'
ou/u	
chahout/chəhut	'small/large black animal'
hatrouyq/hətruyq	'small/large wet object'

In these sets the **inverse of oral cavity** iconism in some sense obtains, for the **narrow pharynx (RTR)** counterpart vowel (e.g.ei in qbrei) is at the same time a **lower** (wider, oral) vowel than the wide pharynx (ATR) vowel (e.g.i in qbri). And in **pharynx** symbolism, it is the narrow pharynx vowel that signals DIM while its wide pharynx counterpart is AUG. The principle of **cavity size** as an **analog** to **referent size** is, however, a consistent one.

Given two apparently conflicting ways for creating cavity analogs for ideophones, one might expect a generally chaotic picture among this class of words. However, quite the opposite is, however, the case, as reflected in the following array of Rengao vowels along the **interlocking continuum** from DIM to AUG iconism:

Narrow Pharynx		Wide Pharynx	
Narrow Oral	Wide Oral	Narrow Oral	Wide Oral
ei	ou	i	u
ɛ	ɔ	e	o
	a		ə

DIMINUTIVE ←----------→AUGMENTATIVE

Thus **narrow pharynx (NP)** vowels are more DIM than **wide pharynx (WP)** vowels and **narrow oral (NO)** are more DIM than **wide oral (WO)**.

The ideophone continuum is exemplified in the following sets:

(ɛ<a)<(e<ə)

prɛw	'very tightly woven material'
praw	'less tightly woven material'
prew	'rather loosely woven'
prəw	'very loosely woven'

(ɛ<ɔ)<(i̊<u)

təplɛp	'tiny plump person'
təplɔp	'smallish plump person'
təplip	'large plump person'
təplup	'very large plump person'

(ei<ɛ)<(i<e)

qbrei	'tiny red object'
qbrɛ	'small red object'
qbri	'medium-sized red object'
qbre	'large red object'

(ɛ<a<ɔ)<(u<ə<o)

chahɛh	'very small mouth'
chahah	'small mouth'
chahɔh	'medium-sized mouth'
chəhuh	'rather large mouth'
chəhəh	'large mouth'
chəhoh	'very large mouth'

(ei<ɛ)<(i<e)<(a<ɔ)<(u<ə<o)

raheik	'very small nose'
rahɛk	'medium small nose'
rəhik	'slightly small nose'
rəhek	'smallish regular nose'
rahak	'medium regular nose'
rahɔk	'larger regular nose'
rahuk	'large nose'
rəhək	'very large nose'
rəhok	'exceedingly large nose'

By way of comparison, one may also note the relative ordering of oral-pharyngeal vowel sets in Igede (Nigeria) ideophones along lines discovered for Rengao:

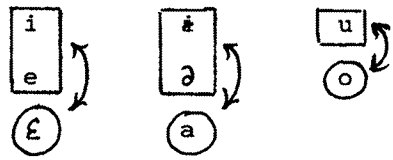
	Narrow Pharynx		Wide Pharynx		
	Narrow Oral	Wide Oral	Narrow Oral	Wide Oral	
Rengao:					
	taplɛp	taplɔp	təplip	təplup	'round belly'
Igede:					
	gwɛgwɛ	------	gwigwi	gwugwu	'running in fear'
	hyɛhyɛ	hyɔhyɔ	------	hyuhyu	'procession (ants, animals)'

LESS EXTENDED (DIM)<----------->MORE EXTENDED (AUG)

Even though there are gaps in these Igede samples, the progression is identical and, I suggest, not accidental.

2.2 Korean ideophones

Korean ideophones have for a long time been of special interest, since as Martin (1962:177) notes "certain of the facts run counter to the widespread assumptions about the psychological universality of connotations associated with vowel qualities ('little things represented by close vowels, big things by open ones'). Martin had in mind vowel ablauting of the following types (Kim 1977):



which function in ideophones such as those below:

i,e/ɛ	
sinɲkɨl	'smiling'
sɛnɲkɨl	'smiling brightly/affectionately'
mesikkəpta	'nauseating'
mɛsikkəpta	'a little nauseating'
ɨ,ə/a	
kɨlkcək	'scratching'
kalkcak	'scatching (small, quick moves)'
həlttək	'panting'
halttak	'panting (weak, short gasps)'
u/o	
tunɲkɨl	'somewhat round'
tonɲkɨl	'somewhat round (small)'

Since those ideophones cast **lower vowels** in the role of

DIMINUTIVES, Kim (1977:67,68) concludes that 'the correlation between the phoneme alternation and the resulting connotation shift in Korean is different from those observed in other languages, thus **invalidating any claim that such a correlation is universal**.

Kim's problem, as made clear in the Rengao ideophones, is that only **oral cavity** parameters have been considered in iconism literature (in fact, since Plato's **Kratylos**). When **pharyngeal cavity** volume in considered, however, a universal can indeed be stated, namely:

CAVITY EXTENDEDNESS IS ICONIC OF REFERENTIAL EXTENDEDNESS

In which 'CAVITY' can be either Oral or Pharyngeal.

Recently the role of pharynx (tongue-root) articulation in Korean ideophones has, however, begun to be discussed in work from an autosegmental perspective (Kim 1984).

In summary, Rengao, Igede and Korean ideophones may be said to reflect the following iconism:

	SIGN	**REFERENCE**
FIGURE (Bounded):	narrow pharynx/RTR	DIM
GROUND (Extended):	wide pharynx/ATR	AUG

That is, the sign figure Narrow Pharynx is iconic of the referential figure DIM. Wide Pharynx, similarly, is a sign ground icon of the referential ground AUG.

I will give some evidence next that the pharynx in figure vs. ground configurations (i.e. bounded vs. extended) can function as an iconic sign vehicle for referential figure vs. ground distinctions other than just DIM vs. AUG.

3. Evidence from Grammatical Structuring

3.1 Monofocal vs. polyfocal in New Guinea

Languages of New Guinea are notable for their 'clause-chaining' patterns in which multiple 'medial verbs' are strung together and the entire sequence ultimately terminated by a 'final verb' (Longacre 1972). In Bena Bena (Young 1964), medial verbs exhibit a vowel ablauting pattern of the following sort (illustrated in the verb fi 'to pierce'):

fi 'pierce'

	Sg	Dl	Pl
1	fiqohuto	fiqohuto	fiqohuto
2	fiqohuto	fiqehite	fiqehite
3	fiqohuto	fiqehite	fiqehite

Where: -o-/-e- 'past'
-hu-/-hi- 'to be'
-to/-te 'same subject'

As will be readily noted, the suffixed morphemes all observe a **vowel harmony** as follows:

	Sg.	Dl.	Pl.
1	back	back	back
2	back	front	front
3	back	front	front

Young has labelled this distinction:

o...u...o MONOFOCAL: first person or singular

e...i...e POLYFOCAL: non-first person or non-singular

This kind of vowel alternation is, in fact, a Pan-New Guinea feature, also turning up in, for example, Yagaria in the verb root vowel (Renck, ms):

do 'to eat'

	Sg	Dl	Pl
1	dodue	doduqe	dodune
2	dodane	dedaqe	dedae
3	dodie	dedaqe	dedae

The question is, 'Why should **ego** and **singular** be treated in the same way? One may, of course, argue that the signs are merely **arbitrary** and any other configuration could just as easily have happened. The fact is, however, that this pattern **did** get created deep in Papuan history and one is led to inquire whether it reflects any **perceptually/conceptually natural grouping of references**.

The motivation for the monofocal vs. polyfocal phenomenon seems to be that: **singular** is a well bounded notion (i.e. FIGURE), while Dual and Plural are oft observed extended ones (GROUND).

However, **ego** and any concepts involving **solidarity with ego** are also Figural, while all references **away from ego** are extended, i.e. GROUND.

Now as to the vowel signs, suppose we reinterpret the Papuan **back vowels** as RTR, that is as **narrow pharynx** vowels. Likewise, the front vowels would be ATR or **wide pharynx**. If so, a natural iconism reminiscent of that in the ideophones results:

	SIGN	REFERENCE
FIGURE	RTR (back vowels)	Singular, 1st person
GROUND	ATR (front vowels)	Non-singular, non-1st person

Thus narrow pharynx is iconic of ego reference as it was DIM in the ideophone cases. This accords with ego-DIM associations in other languages. (Ultan, 1970.23).

3.2 MONTAÑES VOWEL HARMONY

McCarthy (1984) reports the following vowel harmony sets in the Pasiego Montañes dialect of Spanish spoken in north-central Spain:

[+ tense]		[- tense]	
i	u	I	U
e	o		O
a		A	

He suggests in passing that [- tense] may turn out to be best understood as [-Advanced Tongue Root]. This would, as a matter of fact, accord well with the facts of West African vowel harmony sets, which were also originally labelled 'Tense' vs. 'Lax' until Tongue-root descriptions were discovered to be more accurate (Ladefoged, 1964; Stewart, 1967).

The Montañes vowel sets above are exemplified only in **morphological** contrasts of the following sort:

	[+ tense] (ATR)		[- tense] (RTR)	
NUMBER	soldaus	'soldiers'	sOldAU	'soldier'
	simpatikus	'congenial(pl)	sImpAtIkU	'congenial(sg)'
SIZE	tripa	'belly'	trIpU	'(child's) belly'
	pitrina	'waistband'	pItrInU	'Idem. (DIM)'

MASS/COUNT	limpju	'clean (mass)'	lImpjU	'Idem.(count)'
	miyu	'my (mass)'	mIyU	'Idem (count)'
GENDER	gulundrina	'swallow (fem.)	gUlUndrInU	'Idem (count)'

Now, abstracting the morphological contrasts, as well as taking seriously the tongue-root (pharynx width) involvement and interpreting these associations as iconic figure and ground, the following emerges:

Conceptual category:	GROUND (extended)	FIGURE (bounded)
Iconic sign:	ATR (wide pharynx)	RTR (narrow pharynx)
Reference:	Plural	Singular
	Augmentative	Diminutive
	Mass	Count
	Feminine	Masculine

The array above satisfies one's intuitions on iconic extendedness in every respect except perhaps that **feminine** is grouped with **Augmentative**, and **masculine** is grouped with **Diminutive**, while the reverse is more familiar in Indo-European. However, in other languages, the **feminine** as **extended** vs. **masculine** as **bounded** is also to be found. Consider, for example, the range of uses of the following suffixes in **Tehid**, a Papuan language of Irian Jaya which reflects the metaphorical dualism pervasive in that culture (Flassy, 1978):

tena	'a hand'	wet	'child'
tena-m	'onewhole hand'	wet-m	'girl'
tena-w	'part of hand'	wet-w	'boy'
tena-y	'both hands'	wet-y	'girls (many)'
wkhoit	'a tree'	sika	'cat'
wkhoit-m	'large tree'	sika-m	'female cat'
wkhoit-w	'small tree'	sika-w	'male cat'
wkhoit-y	'many trees'	sika-y	'cats (pl.)'

That is, m embraces such notions as '**whole, large—and female**' while -w refers to 'part, small and male'. This is not unusual in a New Guinea world view.

3.3 PIE QUALITATIVE ABLAUT

The most celebrated--and fundamentally unanswered--question of vowel alternation in the Western linguistic tradition is that of **Proto-Indo-European (PIE) ablaut**. Since the nineteenth

century, comparativists have sought an explanation for the characteristic vowel variations associated with a number of Indo-European morpheme categories, for example in Greek:

PRESENT		PERFECT	
δέρκομαι	'I see'	δέδορκα	'I have seen'

Thus, qualitative ablaut in Greek involves an e vs. o opposition regularly associated with 'present' vs. 'perfect' aspectual (as well as other) categories. Accounts of the origin of this e-o alternation have been generally of three types:

1. Pitch-accent conditioning: proposed by Brugmann (cf. Lehmann 1955:14,15).
2. Affixal (e- or o- colored) conditioning: for example a lost palatal suffix (e.g. Schmalstieg, 1980:22).
3. An unaccountable morphological feature of the proto-language (see Buck, 1952:110, Hudson-Williams, 1966:46, Schmalstieg, 1980:23).

Briefly stated, these positions all leave one less than satisfied. The pitch-accent solution, for example, fails to work in a number of cases (e.g. λέγω vs. λόγος). The affixal-loss explanation involves an absolute neutralization of the putative original conditioning factor, with the result that the only evidence for the conditioning environment is precisely the conditioned element to be explained, again a less-than-happy alternative. The acceptance of e-o as an artifact of the proto-language, however, still leaves language detectives with the nagging suspicion that there really is something going on, IF ONLY A KEY COULD BE FOUND.

I have suggested in a separate study (**"Indo-European Qualititative Ablaut as Pharynx Iconism"**) that these vowel alternations do indeed have an explanation. Specifically, they are, I believe, motivated at the most fundamental perceptual level by the same metaphorical strategy as exhibited in Rengao ideophones, that is:

e-grade = Wide Pharynx	o-grade = Narrow Pharynx
Extendedness Iconism	Boundedness Iconism
Greek present	Greek perfect

This **Pharynx Iconism hypothesis** for IE adds the final piece to the qualitative ablaut puzzle as reinterpreted by Pulleyblank (1965) in light of Kuipers' (1960) work on Kabardian. Pulleyblank's proposal goes briefly as follows:

(1) IE e–o as a front-back two vowel system is a typologically suspect reconstruction since no modern language attests this kind of vocalic structure. Better is a Kabardian-type system based on vocalic openness as pointed out by Trubetzkoy (1949) and further discussed in Kuipers 1960. Thus:

*ə

*a

(2) Semantically, IE **morphological** categories distinguished by this *ə vs. *a opposition may then also be compared with parallel functions in Kabardian. Traditionally, such morphological contrasts in Kabardian have been called '**centrifugal**' vs. '**centripetal**' or in Kuipers' terms '**extrovert**' vs. '**introvert**', for example:

EXTROVERT (centrifugal) ə-/zero-grade	INTROVERT (centripetal) a-grade
Direction outwards	Direction inwards
s 'leading (out)'	sa 'leading (in)'
z 'throwing (out)	za 'throwing(in)
Goal-directed	Goal-less
g' 'spinning (trans.)	g'a 'spinning (intr)'
j'a-pl 'looking at him'	j'a-pla 'looking'
Attributive	Adverbial
z 'one'	za 'once'

In this way the ə/zero-grade vocalism marks **extrovert** categories while a grade signals **introvert**.

Pulleyblank's proposal is that IE qualitative ablaut lends itself well to interpretation in parallel fashion, assuming a *ə vs. *a vowel system. The results would then look as follows regarding the morphological distribution of this opposition:

EXTROVERT *e(ə)-grade	INTROVERT *o(a)-grade
Verb ('active/directed')	Noun ('static/undirected')
Greek λέγω	λόγος
Latin tego	toga
English sing	song
Verbal noun	Noun
λέξις 'speech (act of)	λόγος 'word'
Present	Perfect (completed state)
λείπω 'leave'	λέλοιπα 'have left'
πείθω 'persuade'	πέποιθα 'trust'

Adjective		Noun	
Gk. ψευδής	'false'	ψεῦδος	'lie'
Skt. arca-	'brilliant'	arka-	'ray'
Skt. roca-	'radiant'	roka-	'lustre'
Person			
Gk. φέρετε	'2nd person'	φέρομεν	'1st person'

Pulleyblank's proposal, then, is that each of the above morphological functions that share a common **vocalism** also share a common **semantic** feature as either **Extrovert** or **Introvert**.

In Gestalt terms Kuipers' extrovert and introvert may be very straightforwardly translated as GROUND vs. FIGURE. Treating these categories as matters of **conceptual extendedness** is consistent, for example, with a long tradition regarding IE **atelic-telic** distinctions as **non-bounded vs. bounded** notions (Dahl 1981). Associating first person as figure/bounded/introvert is, of course, parallel to the New Guinea mono-focal phenomenon discussed earlier. The other IE categories above also accord with one's intuitions as to which pole of an extendedness continuum they ought to represent.

The major point I wish to make, consistent with observations from other language patterns already noted, is that IE QUALITATIVE ABLAUT is not only a semantic phenomenon, but furthermore a deliberately ICONIC one. Thus, a reinterpretation of *ə̲-a̲ not only fits the phonology of other attested languages better, but it also reflects that IE participates in a very widespread---albeit heretofore virtually unobserved--pattern of **pharyngeal iconism**. In summary, then, the IE ablaut iconism effects discussed here are these:

Wide pharynx-grade (ATR)	*ə	Extended (GROUND)
Narrow pharynx-grade (RTR)	*a	Bounded (FIGURE)

4. Evidence from pharynx width-associated features.

It will be recalled that in Mon-Khmer phonation types the following general correlations occur:

I.	Voiceless consonants	Narrow pharynx (RTR)	High pitch
II.	Voiced consonants	Wide pharynx (ATR)	Low pitch

I have shown (Gregerson 1984) that pharynx width is sytematically used for iconic purposes in Rengao ideophones, (though some consonant symbolism also indeed exists there). I wish to illustrate in this section that just as pharynx volume may be employed iconically, so may these other phonetically associated

associated features be used to make FIGURE vs. GROUND metaphors. Not only so, but **voicelessness** and **high pitch** are also FIGURAL signs parallel to RTR while **voicing** and **low pitch**, like ATR, model GROUND-type references. That is:

FIGURE:	VOICELESS	RTR	High Pitch
GROUND:	VOICED	ATR	Low Pitch

Typological questions concerning **pitch** and **voicing** iconism have, of course, been raised before (e.g. Ultan, 1970), but with generally uncertain results. The present proposal is to view these questions within a larger network of clustering phonetic characteristics.

4.1 Voicing iconism.

Voiced consonants (especially stops) are often simultaneously characterized as possessing a **wider pharynx** than their voiceless counterparts (cf. Perkell 1969 for English examples). It would not be surprising, then, to find voiced consonants used iconically for AUGMENTATIVES and voiceless for DIMINUTIVES. The following Japanese ideophones are illustrative of a voicing contrast:

a) potori 'small amount of liquid dropping'
   botori 'larger amount of liquid dropping'

b) kotsun 'sound of two small objects meeting'
   gottsun 'sound of two big objects meeting'

In a) voiceless stop correlates with DIM, while voiced with AUG. In b) note that both voicing and long consonants occur to make gottsun the AUG member of the pair.

Voicing in size-sound symbolism is further exemplified in Sunwar (Tibeto-Burman of E. Nepal) intensifiers (M. Schulze, personal communication):

VERB	QUICK ACTION	SLOW ACTION	DISTRBTU.
domtsa 'get fat'	phuk 'child'	phuk	phuk phuk
	bhuk 'long obj.'	bhuk	bhuk bhuk
dooktsa 'fall down'	pu 'small obj.'	etc.	etc.
	bu 'big obj.'		
raptsa 'stand up'	to 'small person/short time'		
	do 'big person/short time'		
	tok 'small person/longer'		
	dok 'larger person/longer'		
khrittsa 'pierce'	pir 'small hole'		
	bir 'big hole'		

khroyktsa 'cut to sew'	tir	'small object'
	dir	'big object (shirt)'
'durtsa 'drop'	pre	'very small object'
	pro	'small object'
	bro	'big object'
'giiktsa 'give birth'	pre	'small mother'
	bre	'large mother

Thus DIM is conveyed by voiceless consonants (phuk) and AUG by voiced (bhuk). However, extendedness iconism is implemented in a variety of functions and fashions above, which may be summarized as follows:

FIGURE Bounded	GROUND Extended
phuk (quick action)	phuk (slow action:contour tone)
phuk (simple action)	phuk phuk (distributive:redup)
pir (DIM size)	bir (AUG size)
to (DIM time)	tok (AUG time)

Narrow pharynx (Vl.)		Wide pharynx (Vd.)	
Narrow oral	Wide oral	Narrow oral	Wide oral
pre (DIM)	pro (AUG)	————	bro (AUG)

Thus extendedness is manifested in a variety of sign forms. Interestingly, note that an oral-pharyngeal parallel continuum seems to be reflected in the pre<pro<bro series in a fashion reminiscent of Rengao and Igede ideophones described earlier. Rather than narrow pharynx vs. wide pharynx vowels, however, a voiceless vs. voiced counterpart occurs.

4.2 Pitch iconism

The correlation of **high pitch** with DIM and **low pitch** with AUG is not a novel one (cf. e.g. Jakobson and Waugh citing Westermann, 1979:200ff.) These pitch oppositions are readily interpretable as instances of FIGURE and GROUND iconism. Consider the following sample sets from Ewe (Ansre, 1961):

dũũ 'sight of a small person'
dũũ 'sight of a dull person'

lilili 'sweet smell'
lilili 'bad smell'

Here the high tone DIM vs. low tone AUG distinction takes on an evaluative component as well.

Pitch may, however, be used in even more abstract kinds of FIGURE vs. GROUND iconisms than DIM-AUG. Bearth (1980) suggests, for example, that in Toura (Ivory Coast) high vs. low tone for a variety of semantic and pragmatic distinctions. He also notes parallels from Wobe and Kpelle:

	High Tone	Low Tone
Realis/ Irrealis	á lō bóí 'I go to the field'	ā lò bóí 'If I go to the field'
Simple/ Habitual	á lóìì bóí 'I go'	ā lō bóí 'I habitually go'
Definite/ Indefinite	tìa <u>nɛ̄</u> 'Tia's <u>father</u>'	nɛ́ kpó <u>nɛ̀</u> 'child gets a <u>father</u>'
New/ Old info (Wobe)	kei dbā dbí 'Kei killed the antelope'	kei mɔ dbà dbí 'It was Kei who killed the antelope'
Specific/ Generic (Kpelle)	ní 'water'	nɛ ní 'fire water (kerosene)

Thus **high tone**, which in human perception has come to be associated with small strictly bounded vibrating systems here apparently becomes an iconic sign for that which is concretely **real, simple action, definite, new** (asserted) information and **specific. Low tone**, characteristic of more extended vibrating systems models such notions as **irrealis, habitual** action, **indefinite** reference, **old** (presupposed) information, and **generic** reference.

Not unlike Toura is Mizo (Tibeto-Burman, India), in which verbs regularly possess two major variant forms, one with HIGH TONES (1, 2) and the other with LOW ONES (0, 3). These tone-types are distributed in a fashion reminiscent of Toura but with further ramifications also:

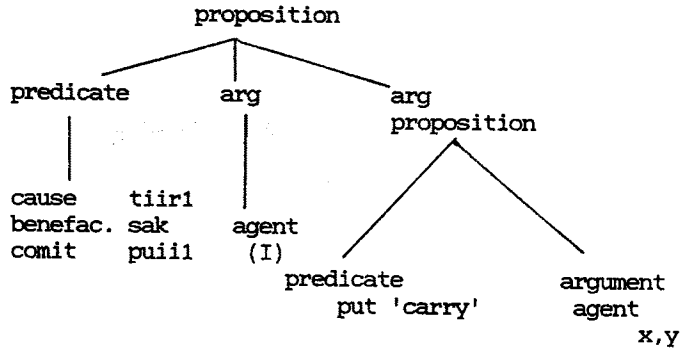
	High Tones (1,2) FIGURE	Low Tones (0,3) GROUND
Condition:	I-boom1 ka-PUU1 ang2 your-box I-carry modal 'I'll carry your box'	ka-boom1 I1-PUT-cuan1 my-box you-carry-if 'If you carry my box'
Simultaneity:	I-boom1 ka-PUU1 ang2 your-box I-carry modal 'I'll carry your box'	ka-boom1 I1-PUT-laai1-in1 my-box you-carry-while-ob1q 'While you're carrying my box'

Relative clause:	
ka-PUU1	ka-boom1 kan2-PUT kha1
I-carry	my-box we-carry det.
'I'm carrying'	'my box that we carried'
Nominalization:	
ka-TRHUU1	ka1-TRHUT-na1
I-sit	my-sitting place
'I am sitting'	'my seat'
Causative:	
ka-PUU1	ka1-PUT-tiir1
I-carry	I-carry-cause
'I carried it'	'I made him carry it'
Benefactive:	
ka-PUU1	ka1-PUT-sak
I-carry	I-carry-benef.
'I carried it'	'I carried it for him'
Comitative:	
ka-boom1 ka-PUU1	ka-boom1 ka1-PUT-puii1
my-box I-carry	my-box I-carry-with
'I carried my box'	'I helped him carry my box'

The pragmatic principle at work here seems, as in Toura, to be implemented iconically as follows:

High Tone (1,2)	Low Tone (0,3)
FIGURE	GROUND
core verb is:	core verb is:
ASSERTED,	PRESUPPOSED,
Foregrounded	Backgrounded

Thus the **conditional, simultaneous** and **relative** clauses take the **LOW TONE** verb for put 'carry', while their assertional main clause counterparts take the variant puu1 'carry'. From an informational perspective, the **nominalized** form of a verb is clearly the **non-assertional** variant and thus takes trhut (low tone, GROUND). The **causative, benefactive** and **comitative** are all achieved by suffixing an appropriate operator (tiiri 'cause', sak 'benefactive', puii1) which function semantically as the **highest predicate** associated with the **highest AGENT**, that is:



Thus, the **core verb** 'carry', not ranking as the highest predicate is treated pragmatically as parallel with other notional GROUND information and receives the Low Tone variant put.

5. Conclusion

Language is perhaps the clearest mirror of man's mind. If, in this connection, one takes seriously the implications of Gestalt research as to how humans process their textured universe, one is not surprised to find the tell-tale traces of the superimposition of FIGURE and GROUND distinctions in language structuring. Not only so, but this simple-minded fundamental template appears to be a favorite tool in human expression, for it seems to have been applied rather relentlessly under all kinds of guises. And since it is further true that humans are, if they are anything, **metaphor-makers par excellence**, it is also not surprising that they fashion their expressional forms as concrete analogs of their referential forms. Thus perceptual FIGURES and GROUNDS are translated into their corresponding linguistic icons.

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INVITED LECTURE

THE CULT OF WEAPONS IN ROCK ART AND INDO-EUROPEAN LANGUAGES

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Thesis: prehistoric art is preliterate art. As such it may incorporate images to prompt recall of words, figuratively or literally used, and homonyms as well. Lexicon thus can and must be used as a key in decoding messages expressed in rebus-writing. Prehistoric visual "art" moreover should always be tested for a pictographic, as well as purely pictorial content. (1)

It is only in the proto-historic and historic periods, with the advent of writing, that, occasionally, figurative motifs are accompanied by verbal text. The latter is typically fragmentary. The Bayeux tapestry, for example, was embroidered with images showing incidents of the Norman Conquest and with a Latin text describing the same. This marriage of verbal text with a series of pictures culminates in the American comic strip of the 1890s and following years. Another sort of comic is the one sans paroles, which can be read with a knowledge of things only, language not being needed.

However, there are visual images that give up their message only to initiates who know the names of the things pictured. This is pictography. Such an idea was adumbrated by the discoverer of Minoan Crete, Sir Arthur Evans, who suggested early this century that the rock carvings of Liguria, Scandinavia, Ireland and other territories might involve pictography. That is to say, the scenes incised on the rocks might reflect not only the visual impressions left on viewers, but also should subtly hint at lexical facts of their languages. Evans cited the familiar case of the pictographic origin of the letters of the Semitic-Graeco-Roman alphabets, where e.g. the letter that bears the Greek name *aleph*, a sign whose name was not merely an arbitrary label, but also meant 'ox'; and the shape that we know as *A* was originally the image of the head of an ox: . And so on with *beta*/beth 'house' , *gamma/gimel* 'camel' etc. An especially telling case is that of the Egyptian hieroglyphic sign which signified 'water' by representing

its waves and suggested the Egyptian word *mem*, related to Arabic *mem* and Hebrew *mayim*, which all mean 'water'; it will be noted that the angular form of the capital *M* remains similar to the pictogram in form and also in the sound represented. (A phonetic sign derived from this is a single ripple for the dental nasal [n].

Generations of artisans could not have maintained their traditions by instruction in the materials and techniques, the canons, purposes, and calendar of their art without the medium of language. It is unavoidable, moreover, for creators of the visual arts to escape the influence of their languages when they execute an image: "...every experience is saturated with verbalism," as American's greatest linguist put it (Sapir 1933/1949: II). A telling example of the interpenetration of verbal and other experience is given in the following anecdote: a man coming under police surveillance is warned of this by a friend's sending him a signal. The "message", delivered in an envelope, is a coffee bean. Now, Hungarian is the friends' mother tongue; they also share a school language, Latin. The Magyar word for 'coffee' is homonymous with the Latin for 'beware': *kávé* and CAVE. A parallel is the case of an Austrian woman in World War II receiving a signal to travel to a pre-arranged meeting place to visit her husband, who was in hiding; in this instance the envelope bore a caraway seed. Relevant here is that this spice, in Latin CVMINVM, in German *Kümmel*, is called in the couple's dialect *kimin*, a near-homonym of *kimm* 'come'. -- This is writing 'with things', rebus in Latin. Another recent example of rebus "writing" occurred in Ireland after the Easter 1916 Rising. The Black and Tans, who burned the city of Cork, thereafter boasted their feat by wearing on their berets a burnt cork.

Such has its limitations, of course: messages about elephants, galaxies, or, at other ends of the scale, protons and abstractions, could hardly be so transmitted. Jonathan Swift ridiculed the idea that words were replaceable by things in a scene of Gulliver's Travels in which the Sages of Laputa stagger around under the weight of sacks in which they carry with them the things they wish to communicate about.

If the thing, however, proves too unwieldy--either too big, or too small--or if "it" is purely a construct of the imagination, the difficulty can be resolved if the first place by substituting an arbitrary symbol or an icon, for we can make images on a colossal scale or in

Figure 1a. Grave stele of a weaponed-warrior ca. 2300 BC (Lunigiana, Anati 1972)

Fig. 1b. Gynecomorphic palstave-head ca. 1400 BC (Brittany, Briard 1976:112)

masculum et feminam fecit eos

woepen-monn & wífmonn geworhte hiu

Matthew XIX.4, Genesis I.27 (Biblia Vulgata & Lindisfarne Gospels)

miniature. And then, even if there is no direct intention to isolate and register language directly, even if such were imaginable to those who had never experienced writing as we know it, there is nonetheless a principle that fortunately guarantees that an artist will inevitably and unwittingly intertwine in the fabric of his visual images some indication of the language he speaks. Homo fingens is also homo loquens. A picture, in other words, stands not only for the thing it represents, but also for its name in the language of artist and viewer. Because these two personae may not share the same language, it happens that a viewer does not understand what the artist meant by his picture. This is the dilemma of the archeologist and the opportunity of the etymologist-lexicologist.

The principle that a picture stands for a thing AND its name had to be appreciated before the Egyptian hieroglyphs could be deciphered, for it was the trick seized upon shortly before the dynastic period by anonymous scribes to record the names of their (illiterate) masters. The success of Champollion et al. in reading the hieroglyphs lay in seeing when a glyph stood for the thing it pictured and its name and when the image stood purely for some phonetic value, a homonym of the name of the thing depicted in some cases, and for a metaphoric use of a word-and-thing, in other cases. Applied to English, for example, the picture of a female sheep, a *ewe* (pronounced [ju], might also be read as meaning any of the homonyms of this: the *yew tree* (taxus), the name of the letter *U*, or the second person pronoun *you*. (See Figure 2.)

Now, the identical principle obtains in the reading of the logographic Chinese letters. There, Karlgren (1929:46) found that the pictures of certain animals as votive symbols made good sense only when read as puns. Representations of bats, stags, elephants, sparrows, swallows and rhinoceroses, had nothing to do with these creatures as such that the names of these beings were, respectively, homonymous with Chinese words for 'happiness, prosperity, good auspices, rank (eminence), enjoyment (feasts), and 'sacrifices'. --The implication for archeology and iconography is clear: interpretations of the pictures of objects are pointless and inevitably false when these pictures are employed as signs, not of the things pictured themselves, but when they stand for homonyms of the names of those things. Two more related principles need to be adduced.

Figure 2. Early Egyptian pictography: The *Nar-Mer* palette (Gardiner 1957: 6-8). Verso of the Slate Palette of Narmer (Dyn. I). This is one of the oldest specimens of Egyptian writing known. The name of the king, written with the *nr*-fish and the *mr*-chisel, occupies the banner ... between the Hathor-heads.

If Sapir wrote of the saturation of experience with verbalism, the obverse of this is given by Malinowski: "...all ...linguistic material is inextricably mixed up with, and dependent upon, the course of the activity in which the utterances are embedded" (in Ogden & Richards 1923: 311). Linguistic typology and habits of upbringing have to be recognized, too. If we are accustomed to read pictures as substantives, the noun-verb distinction is less pronounced in some languages. The hieroglyphic sign is sometimes to be read as our noun 'feet/legs', but other times as the verb 'to go'.

Likewise, means both 'eye' and 'to see'; furthermore, in Egyptian and other cosmologies the sun and moon are sometimes termed the 'eye(s)' of the sky; and the woman of the *Song of Songs*, black but beautiful, is dark because the sun has 'looked' upon her.

Further, let us note the implications for archeologists who would read the rocks of the Val Camonica, Scandinavia and elsewhere of a metaphor and a type of picture from the Kwakiutl people of British Columbia. They have a ritual and attendant metaphor reflecting their whaling culture. A young man of a family privileged to hunt the whale who wishes to take a girl as his bride strides, harpoon in hand, to her house and launches his weapon into the dwelling. He thereupon refers to the object of this pursuit, no less than to that of his livelihood, as his "whale". An alien interpreter of pictures of the Kwakiutl, without information about the language and its metaphors, on finding the image of a whale would only "read" here some interest of this tribe in whales, the literal value of the sign. Unless our interpreter knew something of the language he would never in his life divine the reference to a bride. (Boas 1929/1940:237; Cf, Fig 3, after Sydow 1923: 335.)

Now, for the application of these lessons to reading the rocks of the Val Camonica, Scandinavia and, *mutatis mutandis*, other territories. We must reverse the noxious fashion of the past fifty years, sorely aggravated by the meaningless formalism of the last twenty-five, which determine that archaeologists either do not learn ancient languages or that they do not systematically apply them when indeed they have been well-schooled. (Lest anyone take my remark as a gratuitous slur on formalizers, the mathematically astute ["numerate"] will be aware that it is the property of "formal" systems by definition that their signs or symbols are "meaningless".)

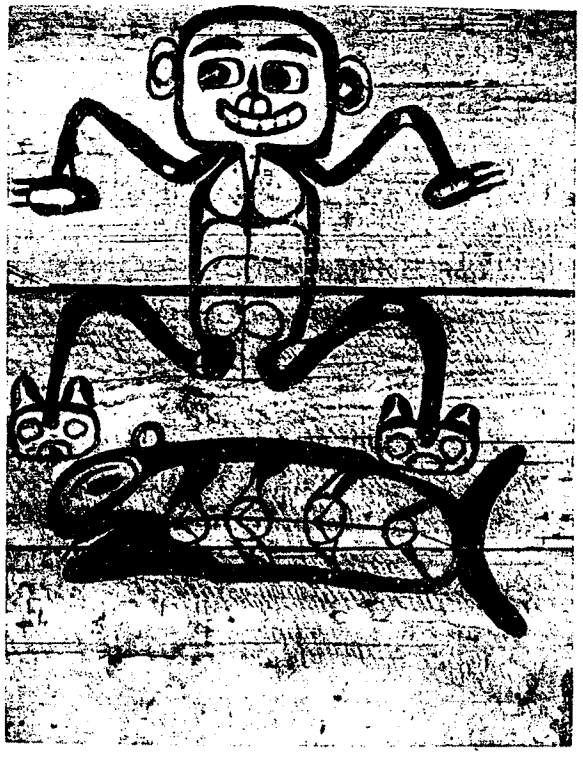


Figure 3. Kwakiutl whale motif surmounted by a human [female?] figure; painted plank wall of a house (Sydow 1923: 335). This, as the other decorations of the family dwelling, are arranged in a heraldic style. Given Boas's report of the metaphor for 'bride', literally 'whale', this image should be re-examined for lexicographic, as well as mythological values (Boas 1929/1940: 237).

Our libraries are full of the treasures mined by generations of philologists in Classical, Biblical, Oriental, African, New World, and Asian cultures and languages. Modern anthopology has often made its contribution. I now proceed to show that Indo-European lexicology can illuminate some of the obscure matters of the prehistoric rock art.

At the 1984 Val Camonica Symposium (Breno, Italy) attention was called to the cult of weapons in the rock art there and in Scandinavia. Nordbladh reminded participants that if the images of this cult were simply documentary in nature, we should expect scenes of the *coup de grace* and of the sinking of ships etc. We do not have any, as we do e.g. in Assyrian, Egyptian, Roman, Greek, or Aztec pictures. That the warriors of the Camunian art are not actually fighting, but engaged in warrior dances, has been well argued by Ragazzi. Another matter, that the male images characteristically display the ithyphallic state, suggests strongly that fertility-matrimonial rituals of a warrior society are depicted. Simoes d'Abreu has carefully dealt with such scenes. --The lexical evidence that I will adduce argues strongly that these scenes note the frequently celebrated wedding-and-fertility rites of a warrior people who practiced a sympathetic magic uniting human and agricultural fertility and gave verbal expressions to their ideology in metaphors adverting to weapons and their use.

Etymologists must inform themselves about the realia as these are given in the dirt archeology and in the iconography of rock art. By the same token, archeologists can "read", within bounds, the metaphors, as well as the primary, literal, values of objects found in graves, hoards, depots, and sacrificial deposits or depicted in scenes of rock art, no less than the anthropologist or iconographer, knowing Kwakiutl language and its metaphors, will understand the full meaning of the image of a whale in a Kwakiutl context.

Mutatis mutandis it is so with the cult of weapons, Pace the objections of those who, while pretending objectivity or neutrality, uncritically recite neo-Victorian dogmas that are wholly anachronistic and irrelevant to the cultures that have left us these marvelous scenes of ithyphallic warriors. Those ideas are by and large a development of the past two centuries, culminating church policies of the Reformation and Counter-Reformation that led to the destruction of much material in the old churches deemed to be of non-

Scriptural inspiration. (Nor should the destruction of pagan masterpieces by under Constantine and others be forgotten.) The lusty scenes of the rock art tell us things that only folk without anachronistic biases will understand. What is now private, tabu, or even vile was once public and scaramental. --If the harpooned "whale" is a Kwakiutl whaler's bride, our lexica, which go back millennia, will de-code for us metaphors of the rock art and the finds of archeology.

The daggers, swords, sheathes, chapes, axes and halberds of Indo-Europeans cannot be read merely as such but must be interpreted in the light of Indo-European lexicon referring to the objects pictured on the rocks.

Consequently, archaeologists must include in their kit of methods and materials a good mastery of language, no less than etymologists and other linguists cannot really come to grips with language unless they are simultaneously interested in the world of the speakers of those languages.

Those languages that have survived have been handed down to us in unbroken tradition from the remotest past. Although many, after some transitional periods of bilingualism, have been lost, and fewer languages survive than were once spoken, nonetheless we are in a more favorable position with regard to language than to material culture, which undergoes rapid change. We would have little difficulty conversing with the great-grandparents of our grandparents, by and large. But when it comes to a comparison of our respective material cultures, we would be strangers, and verbal communication would be difficult in precisely those matters where material culture is crucial. For example, driving today involves automobiles, which were unheard of when my grandfather was born. A steering wheel or a tiller then only directed boats. No human flew when my parents were born, and so on. This is the very reason why the linguist must also be a historian and archeologist, but at the same time there is a hidden value in the study of language for historians and archaeologists.

The languages that have survived to our day conserve much evidence of life in former times. Archeologists, it seems to me, seldom avail themselves of this resource, but small wonder, since linguists of the past fifty years have even denied the relevance of history, of the environment, of culture, of meaning in general

to linguistics. Modern linguistics, especially in North America, has made itself largely irrelevant to archeology and ethnography.

One of the few linguists to attend to archeology in his work is Saul Levin: "Glimpses of life in very remote times are the joy of historical and comparative linguistics. Often they confirm the findings of archeology and make them more explicit. But they are just as fascinating when they bring out something of which we would otherwise have had no inkling" (Levin 1975: 246).

The same spirit abode earlier in the person of Dénis Fustel de Coulange: *"The contemporary of Cicero speaks a language whose roots are very ancient...this language...has kept the impression [of the thoughts of ancient ages]. The primary sense of a root will sometimes reveal an ancient usage; ideas have been transformed, and the recollection of them has vanished; but the words have remained, immutable witnesses of beliefs that have disappeared"* (Fustel 1864/1956: 14).

In the following I will adduce from the realia and from the languages facts that are mutually illuminating, making both sets of data clearer than either is in isolation, in their customarily separate, though fundamentally inseparable, disciplines or academic departments.

1. Rock art scenes of archers, bows and arrows. Latin NERVVM and Greek *neûron* yield the modern terms *nerve* and *neurology* (since optics were introduced into medicine), but this was a usage transferred from a more basic concern. Certain of the 'nerves', especially the sciatic, are large and visible to the naked eye, many more only thread-like or even minute. An older tradition inheres in terms such as *nervous*, (to) lose one's *nerve*, *unnerve(d)*, *enervated* etc. The cited Greek and Latin words refer primarily to sinew; sinew is the material of bowstrings. A bow with lax bowstring, or a bow unstrung, is as a man without an erection: such a man is ENERVATVS, has lost his "nerve". Identically in English, the by-form *whang* (from *thwang*) of *thong*, now is a slang word for 'penis'. (In the sense of 'leather strap' it is still in use in the Western US in such locutions as *whale-whang*, i.e. whale skin straps, used as gate hinges). Further lexical evidence necesssary to read the scenes with bowmen: Latin SCROTVM, in modern languages strictly an anatomical term for the sac containing the

testicles, is a word for the archer's 'quiver', i.e. the carrying case of his arrows. Just so, the Russian *tobolec* and Serbo-Croatian *tobolac* mean 'quiver' and 'scrotum' and 'impatiens' [the wild plant that shoots its seed upon touch. Cupid/Eros and his arrows of desire are relevant. Shakespeare knew the image: "... if Cupid have not shot all his quiver in Venice ..." (Much Ado I.1.274). Ancient Germanic evidence lodges in German *Schoss* 'lap' ablaut variant of *schiessen* 'shoot'.

Thus far the metaphors involve the resemblance of bows and arrows, as well as teams of plough oxen, to the physiology and partnership of married life. Lexical facts, and not aprioristic psychological models, were applied to illuminate the visual art. The approach is reversed in the next section: lexical problems are clarified by the introduction of ethnological-archeological facts.

3.0 Indo-European lexical reflexes of the root **pel-*. Etymological dictionaries of the Indo-European languages register under the phonetic shape **pel-* some dozen "homonymous" roots. (See Pokorny 1956: 798-807.) This is extreme. (2) Most of these forms derive straightforwardly from the sense "to strike". A rich semantic development results from the adventitious associations of who strikes what (or whom) with what, towards what end, and to what effects. Thus, we see that this single root idea was employed in verbalizing perceptions and apperceptions relating to phenomena of diverse sorts. The cloth felt, which shows the regular Germanic development of IE **pel-*, was so called because the material is beaten, pressed, compacted (not woven). And the smith's *anvil*, Old English *ane-filte*, was similarly referred to as the mass on which metal wares were hammered, or forged. Words such as English *fold*, German *falten*, Latin PLICARE likewise reflect only secondarily, the turning, but primarily the pressure involved. It is the same feature of 'striking, pressing, beating' that explains words of various IE languages that refer to agriculture and to human fertility. (See Figure 4.)

3.1 English *field*, German *Feld* and the cognates in other Germanic languages, as well as Old Church *polje* 'field' and Indic *pṛthīvī* 'earth' are explained in the same way: the earth, the field is worked, struck with hoes, spades, ploughs. This must be subtle for urbanites, but is so obvious to a farmer that we can only marvel that it is not comprehended by the

Figure 4. From Litsleby, Sweden: the plough, spade, and phallus all represent the male, the furrow, the female. The *Mai* (Maypole) is even today a symbol of life employed at house-raisings, as well as at Christmas and May-Day. The plough-oxen are a metaphor of the team 'yoked together', i.e. man and wife, Latin CONIVGES, Greek sýzygoi. Sowing seed, digging, delving, spading etc. are not figments of a Freudian imagination, but the attested metaphors of Latin, Greek, and innumerable other languages, Indo-European and otherwise. The lexical data confirm the interpretation of Aubrey Burl (1981: 42): "This rock-carving ... shows very clearly the association in the prehistoric mind between fertility, sexuality, and the ploughing and planting of the land." The lexicon of recorded cultures proves it without a doubt.

compilers of the etymological dictionaries. They have pronounced that farmland is 'flat' or 'open'(3). That it is, of course, but even these terms reflect the same root, **pel-*, 'to strike'. Any sane farmer selects level land to work. If there is none, he creates it by terracing a southerly slope. "I would plough the mountains" is an oxymoron, the wild, desperate, boast of a lover who would do the undoable. (See *Dark Rosaleen* in Greene 1954:229.) But a farmer earns his bread in the sweat of his brow; nothing less is reflected in the transition from Latin LABOR 'work' to French *labour* 'ploughing'. The Germanic terms such as English *field* and the OCS *polje* are farmers' names for their land that reflect the toil, not the gradient. Further such cases are rife: German *Mannshauet* is an old word for the measure of land that a man could hoe: *hauen* is 'to hoe' and, less specifically, 'strike'. A vintner is a *Weinhauer*. The English term for 'alluvial plain', *flat(s)*, has also had its semantics reversed by lexicographers innocent of labor: moderns look out on such an expanse of land and pronounce it "flat", i.e. having no vertical relief; but etymologically this level land by a stream, being not only level, hence more readily cultivable, but also enriched by the floods, was named with the Germanic root **f-l-*, IE **pel-* 'to strike'.

In the context of the relevant material culture, we can now also understand the seeming strangeness of the same word used to signify 'apartment', English *flat*. This too was named, not for gradience but the fact that in earlier times such a dwelling was furnished with a plank floor, for planks, we shall again have occasion to note, were first produced by hewing out of tree trunks with adze and side-ax. Cf. the German *Flöz*, more correctly, *Fletz*, an old word for a house with plank flooring, as opposed to one with packed earth, *rez-de-chaussée*, i.e. formerly packed or stamped by foot/heel.

3.2 The Common Slavic word **polŭ* includes among its meanings that of 'sex'; it also reflects the IE root **pel-* 'to strike', if we shed our blinkers. In Russian the word is *pol*, which I re-cast as *pol-1* because of a seeming homonym, which I shall refer to as *pol-2*. These homonyms originated as a single polysemous item.

Given the Serbo-Croatian words *pola* and *polovina*, both meaning 'half', moderns inculcated in Victorian attitudes have jumped to the conclusion that *pol* 'sex' is explained by these, as 'half' the race is male and half

female. So it is, more or less. But internal Slavic considerations require us to see that the form *pol-1* is a constituent of *pola* and *polovina*, not vice versa. We are also compelled to conclude 'striking' is the radical meaning of all these, given the IE root **pel-* that concerns us here. A whole is 'struck' and 'cut' into halves. And a word for 'sex' that adverts to 'striking, cutting' is the rule, not the exception. -- It is a principle, moreover, that transparently relates to the cult of weapons, as well as to the practice of agriculture. And, as swords and ploughshares never were all that distinct, we now see the unity of these with the foregoing words for 'field' and 'earth'. No one should be surprised that Indo-Europeans or anyone else saw and see agriculture and human fertility as similar. A further match is Russian *polosa* 'furrow, strip'. *Pola* in modern Russian especially means 'hem', but deeper in the chronology lie the values 'flap (of cloth') and 'lap' and 'skirt', which are metonymic for the part of the body covered by the garment. Note the intimate synecdoche in Russian *iz-pod poly* for 'on the sly', literally 'under the crotch-piece [of a garment]'.

3.3 *Folk/Volk*, borrrowed into Baltic [Lithuanian] *pulkas* 'crowd'] and Slavic [Old Church Slavic] *plŭkŭ*, Russian *polk* '(army) division']; native Slavic has OCS *polŭ*, Russian *pol-1* 'sex'. The coincidence of senses 'people [in general]' and '[mobile warlike]' band is nearly inevitable in a pastoral warrior society, and reflects as well the concept of 'tribe, lineage' as produced by the sacred act of procreation, namely "striking". The race is propagated and the garden is fructified with good, sound delving, spading, ploughing. Husbandry, after all, is 'farming' in English; *husband* was both VIR/*Bauer* and PATERFAMILIAS

3.4 Russian *pol-2* means 'floor'. Modern Russians find this a puzzling case of homonymy (with *pol-1* 'sex'). Both words have substantially the same declension, as well as the identical derivative adjective: *polovoi* pertains to 'floor', as in the now disused substantival *polovoi* 'waiter'; cf. English *floor-walker*. Adjectival *polovoi* 'sexual' refers to the primeval 'striking, delving' of sex. (2)

Lexicographers-etymologists must here have the skills of culture historian. Planks, or boards, have been

produced by circular saws only for some 140 years; before that, in regions served by advanced steel works, planks were produced by pit-saws. Earlier yet, and still today in conservative cultures, boards are hewn with adzes and side-axes directly from logs or blocks (with the loss of up to 80% of the material). Hence the Slavic lexicon is conservative in referring to a variety of artifacts produced with the ax, such as *pol-l* 'floor [of boards, planks], *polka* 'bench, shelf, berth, bed' (in the traditional East Slavic house)'. (*Pol'ka*, dance in 1/2 time, reflects this root; the word is a reference to Poland; cf. *Mazurka* 'Mazur woman, dance'.)

These terms for artifacts hewn with axes out of tree trunks are formed on the same root as serves to express the concept of 'sex' for the simple reason that the carpenter, the husbandman, the warrior -- which can be functions of the same man -- involve the same general idea of 'striking'. Likewise our Slavic and Germanic terms for the field and furrow, *polje* and *polosa*, which in addition share with procreation the feature of fertility.

3.5 Sanskrit *pṛthīvī* 'earth' derives from the Indic root *pṛ-* 'strike, Proto-Indo-European **pel-*. We have already clarified why. Lexicographers who have missed all these etymologies have simply never swung a hoe or handled a spade. Language usage has always to be understood from the perspective of the human experience, that is the perspective of actual participants in the given culture context, not from the visual impression of an uninvolved observer who is, moreover, not observing very keenly. (Vision, moreover, is a sense that serves from afar, when one is not deeply involved in a matter.)

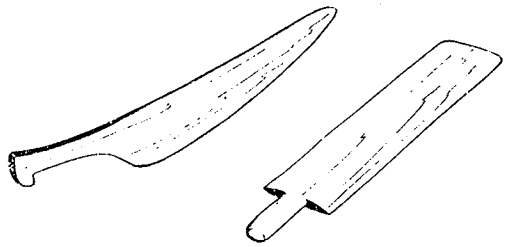
It is not "abstract" underlying forms plus cybernetic rules, as in North American linguistic dogma, that explains lexicon, but only the forms in concrete contexts of situation, plus analogical extensions of forms that took on certain meanings in those situations. This is why words for 'bed, floor, field, sex, folk', and more, can be expressed with the same root. Further ramifications are: Italian *polso* 'wrist', from Latin PVLSVS *[sc. CORDIS]* 'striking, beating of the heart', in the parlance of medical doctors. Consider also, Slovene *moje srce polje* 'my heart is beating'; *polje žito* '(one) winnows wheat', *polje vodo* '(one) bails, scoops water'. -- Indic *pṛthīvī* 'earth', together with OCS *polje* 'field' and

the Germanic *field/Feld*, was named as that which the husbandman "struck" with his hoe, i.e. tilled. -- Besides Russian *polka* 'sleeping bench', there is now a homonym *polka* 'weeding [i.e. with a hoe]'. Western languages have borrowed as an oceanographic term Russian *polyn'ja*, meaning 'open area in an ice field'; etymologically, the ice 'broken' open.

3.6 Russian *polotno* 'linen' and 'roadbed'. The functions of these two referents are in the aggregate extremely diverse. But in their creation, they share one salient resemblance: roadways have to be compacted, pounded solid (cf. "off the *beaten* track, the *trodden* path, VIA TRITA); and *in making linen, flax* has to be pounded, i.e. broken. (Thus English *flax*/German *Flachs* manifest the same PIE root **pel-* as the present Slavic terms.) [Figure 5 shows *flax-brakes/Flachsbrech(eln)* and *flax scutches/Flachsschwingeln.*] --Such a *brake*, variant of *break*, could also serve as a lever to stop a wagon wheel, hence the automotive *brake(s)*. And, the term for 'scutch/Schwingel' used in the Grisons because the prototype was the shoulder blade of an ox, SPATVLA in Latin, is Romontsch *spatla*; the women doing the flax-breaking are termed *spatlunzas*. --This is no divagatory recital of unrelated facts, but is an illustration of the unexpected, unpredictable turns of the human mind as recorded in language. -- Synchronic semantic theory, as well as archeological and iconographnic interpretation, is unviable without mastery of such encyclopedic information concerning both *Wörter und Sachen*.

3.7 Although the ramifications of the PIE root **pel-* are far from exhausted, it is clear enough here that Indo-Europeans verbalized, inter alia, their culture perspective on agriculture *(field/Feld/polje/polosa)* with this root. They also, to conclude this part of the discussion, expressed their concept of 'family, lineage, procreation' by means of the same root, e.g. English *folk*, German *Volk*. The famous carving from Litsleby depicts precisely the values that are revealed by our lexical studies. [See Figure 4 again.]

4. German *Geschlecht: schlagen*. The concept behind modern German *Geschlecht* has eluded the etymologists right down to our day. Kluge-Mitzka postulate a lost sense, 'direction', instead of noting the ubiquitous metaphors of 'striking' with ax or sword,of 'shooting' with bow and arrow, of 'riding', It would be prepost-erous to interpret such images as modern. They are ancient and well-nigh universal. If gunpowder-era



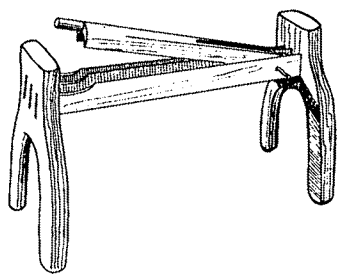


Figure 5. Flax scutches, Schwingel, Schwingelmesser; below: flax-brake, Flachsbrech(el). An essential part of flax-making is to break the plant fibres. Flax/Flachs represents a Germanic word meaning 'break'; Russian polotno means both 'linen' and 'roadbed', as both are produced by pounding.

German uses *bumsen* 'to go boom, shoot' as the term for the male's sex act, our ancestors, we saw above, saw the same metaphor in the bow, its sinew, and the release of the arrow: witness Italian *sparare* 'to shoot [arrow or bullet]', Spanish *tirar* 'idem', French *tirer* 'idem'. Just so, *Geschlecht*, upon the slightest reflection, is a nominal derivative of the verb *schlagen* 'to strike'. It means not only 'sex', but also 'lineage', and was borrowed by Polish as *szlachta* 'gentry, lineage, family'. Though the lexicographers have misunderstood it, through their neglect of the archeology, Old High German conserved the formula: *nah den fordoron slahan*, literally 'to strike after/carry on the line of the ancestors'; this is to reproduce. *Geschlecht*. The OE cognate is *ge-sleaht* 'battle'.

Everyday Italian terms explain it all: both 'hammer' and 'phallus' are termed *martello* (etymologically a derivative of the war god *Mars* [genitive *Martis*]. Archeologists themselves, as well as masons, every day use 'trowels' of various sizes: cf. *cazzola*, *cazzoletto*, and *cazzolino*, endearing "diminutives" of *cazzo* 'prick, penis'. The latter may also be used as *totum pro parte*. Its derivative *cazzotto* means a '[violent] blow'.

The cult of weapons, then, is not a direct and simple veneration of swords and sheathes, of spears and axes, anymore than Parsees worship fire as 'god' or the Catholic practice of "adoration of the cross [on Good Friday, in the Tridentine liturgy] is idolatry. (3) Rather, the rock carvings and the related paraphernalia from the dirt archeology reveal a pictographic litany of the rituals, i.e. the dances, of the life of a farming, herding, fighting folk. For them "life" was preeminently the act that creates life.

5. Latin sexus, VAGINA. If the German term *Geschlecht* 'lineage, progency, sex' is the substantive counterpart of the verb *schlagen* 'to strike', the Latin SEXVS is similar. Given Latin texts, it is obvious that the term was generalized to refer to both male and female after having primarily designated the woman, as in the phrase SEXVS MVLIEBRE. This noun, though those laboring under those anachronistic Victorian preconceptions have expressed reserve, stems from the same root as SECO/SECARE 'to cut'. Should the Victorian chorus again protest that this writer is projecting his fevered imaginations into the data, when it is they who anachronistically distort the matter, the verbal evidence is overwhelming that Indo-Europeans and other

peoples delighted in the metaphoric reference to sex as 'striking' and 'cutting'.

It goes without saying that Latin VAGINA, as German *Scheide*, means not only the case for a knife, but also a woman's 'sheath'. Cf. Plautus' naughty pun: CONVENIEBATNE IN VAGINAM TVAM MACHAERA MILITIS?-- 'did the soldier's "knife" fit nicely in your "sheath"?' (Pseudolus 1181). The bride's trauma was described in a television report on the Maghreb by an Algerian bridegroom: "il", he said, "est comme un couteau". Indeed "it" draws blood, and the requirement of the rupture of the hymen in proof of the bride's virginity is an ancient fetish much alive in Mediterranean countries. Though some scholars have their reservations, it seems to others that Christianity inherited from heathen Greek a term now signifying only a religious song, *hymn*, Greek *hýmnos*. This would have originally celebrated the wounding of the hymen. Haitian Creole has retained French *couper* 'cut' for the same. [A popular song text goes: 'Last night I dreamed I was a knife, and I was cutting you'; and so on, with scissors, saw, ax...]. And in Spanish a man desiring a woman is described in the phrase "*el talla a Maria*" 'he's cutting Maria'.

6. Modern Irish *slicht* 'family', Old Irish *sliucht* 'race, progeny'. This is a derivative or Proto-Indo-European (PIE) **(s)leig-* 'strike, hack, chop'. Cognate are Old English *slice* (*slikja) 'club, baton, bat', Old Frisian/Old Saxon *slec°* '*blow*', *German Schlegel* = English *sledge*, and Latin LIGO (genitive LIGONIS) 'hatchet, hoe'. --Axes, adzes, and hoes are specializations of a single ancient tool; cf. ancient Greek *aksi:ne*: (Levin 1982:48). --Latin LICTOR, also derived from LIG-, named the official who carried the ritual ax bound about with rods, the fasces, symbol revived, without their knowing much about the sexual symbolism, by the eponymous *fascisti*. (Just so, the National Socialists used the swastika, quite unaware of the sexual symbolic value it had in the Iron Age.) Besides 'progeny', the Old Irish *sliucht* literally meant 'section, track, trace', that is, the etymological meaning of Irish *sliucht/slicht* 'lineage, family' is 'section, track, trace'. A percussive instrument is implied: a 'trace' is here the 'trace of a blow'. The immense numbers of daggers, halberds, and axes in grave deposits and other finds, many of them decorated with a decidedly feminine escutcheon, a delta or triangle, can hardly prove to be other than related.

Such an interpretation will also help us to understand the presence of the "wrong" pieces in male and female burials, for a dagger on the pelvis of a female burial might either be an amulet to guarantee a consort in the next life (as female mummies in Egypt sometimes have a stone phallus in the vagina) or it can suggest a synonym of the female part. Exactly what metaphors and metonymies are there is still to be worked out. It is at any rate already clear that this Celtic word for progeny alludes to 'striking' once again. The Welsh cognate *llwybr* 'path', something that is hacked or chopped through the brush, further suggests the warrior society's metaphor of the womb as 'wound', which it is indeed in the wedding night and at childbirth. Cf. Latin VOLNVS (*vulnus*, in traditional orthography). Several loci are to be found in Adams (1982: 152).

7. Varia. If the vulva is referred to metaphorically as the 'sheath' (Latin VAGINA, German *Scheide* etc.) and the 'wound' (see 6, above), it follows that the male counterpart should be the 'knife, blade, weapon'. Every good philologist knows this to be the case many times over. Post-Biblical Hebrew has the Aramaic loanword *zayin*, meaning both 'weapon' and 'penis' (etymologically 'equipment'; see Arbeitman 1980). Thomas Mann quipped about the royal sword and his *sheath/Scheide*. Honi soit qui mal y pense. Juliet's last speech apostrophizes Romeo's dagger; her breast will be its last sheath.

8. Germanic tribal names reflecting the cult of weapons. Whole tribes boasted themselves as the 'knives'. This has been taken by moderns to involve the figure of metonymy (behind which is the principle of contiguity, or association). The evidence from rock art, with its cult of weapons, as well as iconographic inspection of the finds from dirt archaeology strongly suggest that there was more than metonymy in these names, that they were metaphoric, that these boasting warriors saw a metaphor of their masculinity in their swords and daggers. There were the *Sverdingi* 'swordings' (cf. German *Schwert*) and the *Heruli* (cf. Gothic *haírus* 'sword'). And most famous of all are the *Saxons*, Old High German *Sahsen* (singular *sahs* 'knife'), English *seax* 'knife (as a heraldic charge)', Old English *seax*, Old Icelandic *sox* etc. This tribe has left the territorial names of *Essex* < OE *East Seaxe* 'east Saxons'), *Wessex*, *Sussex*, and *Middlesex*. The PIE root is **sok-so-s* 'cutter'; **sek-* 'to cut'. (The Latin SAXVM 'stone' < **soksom* reflects figure-ground inver-

sion: stone knives, copies of the rare copper and bronze prototypes are well-attested in the archeological record of the early Bronze Age in Europe.) Late Bronze Age swords of enormous size were cast. As they have no real cutting edge and measure ca. 70 cm., they could not have been workaday implements (Butler & Bakker 1961).

9. Germanic personal names reflecting the cult of weapons. It is of a piece that the concepts 'family, race, line-age, sex', as well as the names borne by whole lineages or tribes should reflect the cult of weapons that is so richly attested in the archeology and the rock art. It further accords with these facts that Germanic tribesmen took personal names of the same sort and also personified very war and battle.

Since onomasticians have failed to notice the rock art and archeological testimony to the cult of weapons and as archeologists seem not to have noticed lexical, together with onomastic, evidence, we can here unify this material.

In the age of Charlemagne, Frankish men and wives still bore names redolent of the cult of weapons. Wagnerian opera has resuscitated them to some extent. Typically males received names designating them as 'sword' or 'spear', while their women were honored with heroic names portraying them as 'force, energy, struggle' and 'battle' itself. (See Schröder 1938/ 1944:16.)

In the mythology, it was women who 'chose' the men who were to 'die' on the field of battle: the name of these is famous: *Val-kyrie* (Old Norse *Val-kyrja*, Old English *wæl-cyrie*) is a compound of val-'dead; + kyr- 'to choose'. After battle it was these women who guided the glorious dead into the 'hall of the dead', Valhalla. One of the Valkyries was herself 'battle' personified, Hild, modern Hilde. --The Kwakiutl whalers of British Columbia would have no trouble understanding the ancient Germans: just as on the North Sea and Baltic, the Pacific Northwest metaphor for 'courtship' is literally 'making war on the princesses' (Boas 1929/194: 238.)

Now to those personal names. A man whose OHG name means 'battle-sword', Hildi-brant, takes to wife [N.B. this phrase] a woman, whose name chances to be Gertrud, meaning 'spear-thrust' or 'spear-force'. They can name up to ten offspring with a generative (really) grammar that re-combines the four morphemes of their

compound names (a well-established Indo-European inheritance). Their sons will all be named 'spear' or 'sword', i.e. -gêr *and* -*brant*, while the daughters will be called 'thrust/force' or 'battle': -*trúd* and -*hild*. Not only is the procreative act, when well-done, one of heroic exertion, but the mother in labor struggles and suffers for hours, "battling" to bring her child to the light of day.

A table of this martial family follows.

FATHER	MOTHER
Hildi-brant	*Gêr-trúd*
SONS	**DAUGHTERS**
Gêr-brant	*Hild-Trúd*
Trúd-brant	*Brant-trúd*
Hild-gêr	*Gêr-hilde*
Brant-gêr	*Trúd-hilde*
Trúd-gêr	*Brant-hilde*

--Whoever reads Germanic and Indo-European onomastics and also "reads" the Nordic and Camunian rocks, will hardly overlook the agreement of the onomastic and the glyphic records.

10. *Wapman* and *woman* in English: OE *wæpn-mann* and *wif-mann*. On the island of Lindisfarne, off the coasts of England and Scotland, a thousand years ago, a Christian monk translating the passage in which Jesus quotes Genesis to pronounce on divorce of man and wife, falls back on terms that make sense only when seen as faded inheritances from the Bronze Age cult of weapons. The Latin Vulgate text of Matthew XIX.4, after Genesis I.27, reads: *masculum et feminam fecit eos* 'man and women He made them'.

This was Englished in words that are at once familiar and strange to us: *woepen-monn ond wif-monn geworhte*

hiu 'weapon-man and wife-man he wrought them'. *(Pace* the OED, which has the plural accusative pronoun in a normalized form, *hia*, the MS reads *hiu.)*

OE *wǽpn* source of modern *weapon*, meant 'knife' in literal use and 'penis' in figurative speech. This continued into Middle English, as exemplified in the admonition: "Whiles thow art yonge and thi *wepne* kene, wreke the with wyuynge," or in an English more intelligible to modern readers: 'whilst thou art young and thy weapon keen, wreak (work) thee with wiving'. Only since the seventeenth century has the ancient compound wapman fallen out of use, resulting in the current use of the simplex *man* to designate either *homo sapiens* in general or the adult male human in particular. (5) It must be stressed that the ancient Germanic word **mannuz* designated the human adult of either sex, which is precisely *why* the Anglo-Saxon monk of Lindisfarne resorted to old heathen compounds that unambiguously specify the male as 'blade-human' and the female as 'ax-', or 'strike-human'.

The etymology of *wífmann/wíf* hinges on the morphological relation between OE *wíf* 'woman' and *wifle* 'ax', a term previously unexplained. (The initial consonant was later phonaesthemically altered; cf. *whiffle.)*

Internal reconstruction here, as well as in the case of the equally telling paradigm of German *Weib* 'woman' and *Weibel*, reveals the old meanings. German *Weibel* was displaced in the standard language by the Prussian dialect word *(Feld)Webel* for obvious reasons of military history. In the standard dialect the civic functions of the *Weibel* made his title opprobrious: he executed death sentences with the emblem of his office. In conservative Switzerland, however, *Weibel* is still a vernacular word for 'sergeant-at-arms'. Practiced scholars in historical linguistics are well aware of the immense value of the anomaly in morphological networks: regular paradigms are typically regularized in more recent eras by the process of language re-systematization known as "analogy" or "levelling". It is, as Meillet taught, the anomalous pattern that conserves something ancient. (4)

Within the comparative method of historical linguistics, the Germanic word **wifa* for the adult, i.e. sexually privileged, woman is cognate with Latin VIBRARE 'to brandish, swing, strike [with] weapons': IVPPITER FVLMINA/ FVLGVRA VIBRAT 'Jupiter brandishes, smites with, hurls lightning bolts'. There could be no

more apt generic name than *wìf* and its compound *wíf-mann* for the martial women dealt with above in the

family of *Gêr-trûd* and *Hildi-brant*, just as *wapman*, *wǽpn-mann* (Northumbrian *woepen-monn*) labels the corresponding males.

The cult of weapons was not a crude fetish of the implements of death, but a metaphor parallel to the Kwakiutl conception of the "whale": this prey and woman herself are the source of livelihood and life. Rough as the prehistoric rock-carving technique was, it records those aspects of life that the authors felt were "vital". (The execution of this "art" was itself doubtless an indispensable liturgy).

The rock art in its roughly hammered figures expresses a refined, subtly ironic metaphor of Man and Woman. He is represented both anthropomorphically and symbolically in the form of the bow, the spear, and the knife, or sword. She seldom appears in iconic realism, but as the force that makes a man a man, the ithyphallic hero so often seen on the rocks. (See Figure 6.) She appears in the guise of the halberd. (Halberds known from graves, typically of women, are emblazoned with a hardly aniconic triangle.) The woman is also represented by the ax, for both halberd and ax are icons of the union of male and female. A Germanic woman's name attests what, without the linguistic evidence adduced here, would remain totally speculative: cf. Old High German *Wîp-hilt* 'ax-battle' and the Hellenized Gothic Vividis, both recorded as the names of women.

The linguistic evidence clarifies the wonderful "centaur" of Stele II from Caven, his phallus and the helve of his halberd blending into a unit. (See Figure 7.) A close Swedish parallel is the man, phallus united with ax, from Bro Utmark/Sweden and Foppe di Nadro/Italy. (See Figures 8 and 9). It is difficult to envision these scenes as reflecting actual physical practices but, I offer, a case for pictography exists: the old English word for 'married' is *wîf-fǽst*, literally 'fixed in "wife", i.e. 'ax'.(See Figures 10, 11.) --And though it will seem scandalous to some, modern Greek *xira* 'widow' is the feminine form of the ancient Greek adjective *xera* 'empty'.

Students of the rock art will find direct correspondences also in the decorated Bronze Age axes of France, Britain, Ireland, and Iberia, and in the

Figure 6.

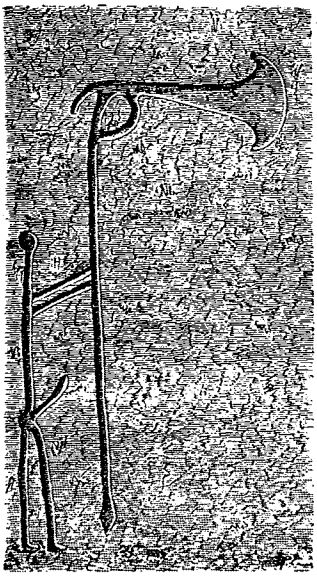


Figure 7.

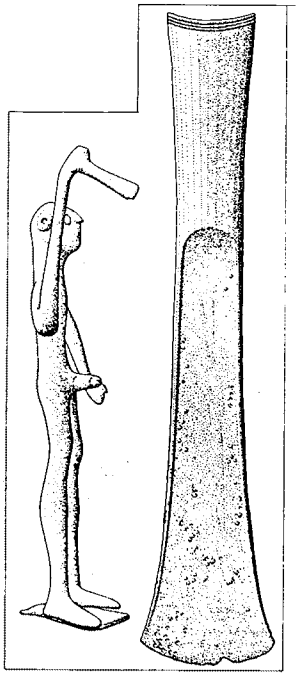


Figure 8.

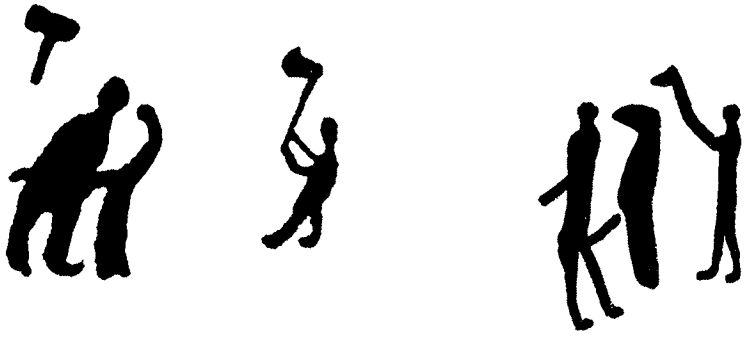
Figure 6. In rock art of widely separated times and places, early Bronze Age Alpine Italy and Sweden, and Hallstatt Iron Age Italy or Austria, an ithyphallic man is associated with ax and halberd. The "centaur" from Caven (Valtellina, Italy) unites helve and phallus (Anati 1968: 85).

Figure 7. His counterpart from Simrislund, (Scania, Sweden), presents an Early Bronze Age ax, closely resembling actual axes that necessarily served only cult purposes, as they are made of clay, coated with thin sheet bronze. This and the Caven (Italy) "centaur" suggest a female value for the ax.

Figure 8. Ithyphallic, ax-brandishing men stand next to women on the famous Strettweg wagon, now in the Joanneum Museum at Graz (Austria).

Figure 9. Bronze-Age warriors, from Bro Utmark (Sweden). The man on the right is aptly described by the Germanic names in *-ger* 'spear', while the figure at left is literally *wif-fæst* 'wife-fast', the Anglo-Saxon metaphor for 'married [man]'. On a severely marred stone at Foppe di Nadro (Valcamonica, Italy) is a pair of men that may represent the same ritual or, what is more probable, the pictographic expression of a metaphor from the languages, in which marriage is taking a woman to wife/zu Weib, i.e. as his 'ax'.

Figure 10.



Figures 11, 12.

Figure 10. On a severely marred stone at Foppe di Nadro (Valcamonica, Italy) is a pair of men that may represent the same ritual or, what is more probable, the pictographic expression of a metaphor from the languages, in which marriage is taking a woman "*to wife/zu Weib*", i.e. as his 'ax'.

Figures 11, 12. Bronze Age Swedish wedding scenes.

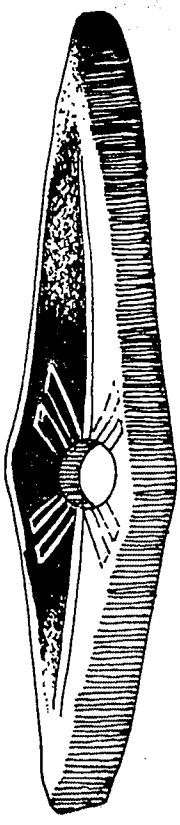
perforated stone axes of the ancestral Kurgan traditions. In all of these cultures the ax is treated as a female piece, an icon of woman united with a male helve. (See Figures 12-16.)

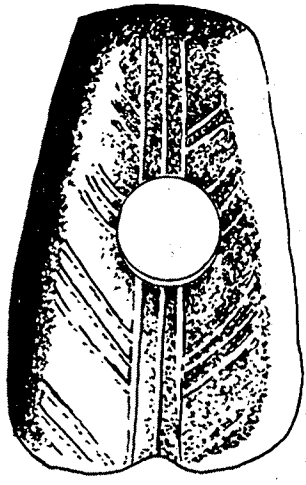
Through technological change the primary female feature, the perforation, was lost, and whereas this received embellishments in the suggestive form of pubic triangle and vertical slash, the later non-perforated axes of copper and bronze were emblazoned with equally distinctive female emblems, through hammering in the earlier metallurgy and through moulded decorations in later exemplars. The modern Czech language captures the male-female images of these realia in the words *topor* 'ax', *topůrko* 'ax-handle', *topořiti* 'to get an erection', and *toporení* 'erection'. No other explanation is available for the ithyphallic state of the men associated with the images of axes in the rock art of Scandinavia and Italy.

With the weight of the present evidence, I propose that the recent vogue of terming the so-called "battle-axes" and ritual blades as "status symbols" can be dismissed as a meaningless label pasted on a misnomer, since it totally ignores the underlying function of the object. Status is an overlaid function here. Such an interpretation is tantamount to terming a Rolls-Royce or a Mercedes automobile a "status symbol" pure and simple. Though it is of course a status symbol, it is nonetheless an automobile, a rich man's automobile, as a Haida potlatch is a banquet, even if one involved with status.

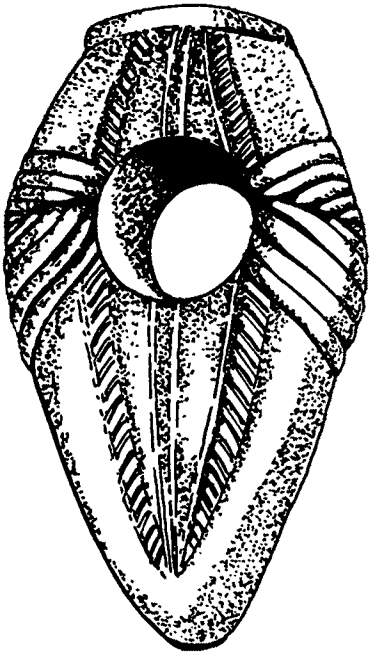
The "battle-axes, together with other cult "weapons", were not merely status symbols; they were amulets, in the first place, to foster the fertile union of man and woman metaphorically represented under the image of the union of ax and helve and, subsequently, to ensure health, ensure crops, protect against lightning and enemy shot, and ward off disease and danger. This tradition has lasted from the neolithic (at least) right down to our time: American pioneer families travelling west by covered wagon practiced the rite of placing beneath the bed of a woman in childbirth a hatchet and a knife, "to cut the pain," as they rationalized the practice. (Information from a UCLA exhibit on the work of folklorist Wayland Hand.)

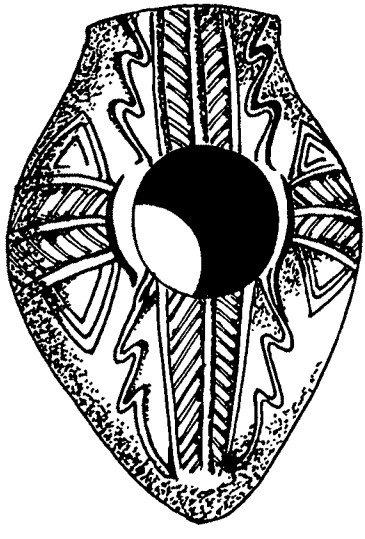
See Figures 5-16. (See Maher 1977, 1979 for the place of the "battle-axes in European folk medicine in modern times.)





Figures 13, 14. Perforated stone ax (imitating copper protoype) and mace, both with female decoration. Corded Ware culture, 3rd millennium BC Upper Austria (Pittioni 1954: 16, after Kneidinger 1948.) Re-drawn by Mana Lesman.





Figures 15, 16. (Perforated stone axes in the so-called "Mycenaean" Late Catacomb culture, Sea of Azov; Sulimirski 1970: after Fabricius 1930: re-drawn by Mana Lesman.)

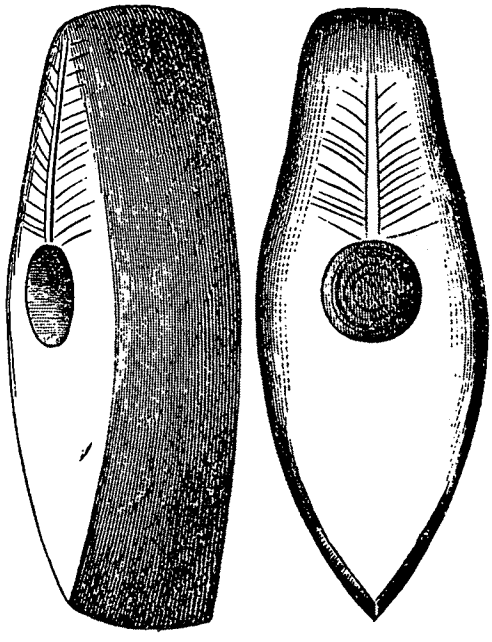


Figure 17. Perforated stone ax of Saxonian type decorated with Tannenzweig/spruce branch pattern. Cf. Latin FILIX 'fern' and 'female pubic hair', as well as names of ferns, mosses, grasses, such as *Venus's hair*, *maiden hair* (Lechler). Discovered ca. 1875 during demolition of a medieval gate in Juterbog, between Berlin and Leipzig. Presumably apotropaic use of an object 3000 years old at the time of the deposit.

The cult of weapons, we have noted, is registered in a difficulty medium, natural stone outcroppings incised with a rough hammering technique. Which should not prevent our seeing there a message as subtle and sensual as those created by artisans with finer technique and equipment at their disposal. If properly deciphered, the prehistoric rock art parallels the glories of the historical ideologies of Mithraism, Christianity, Buddhism, and Hinduism. For, in the scenes of the killing of the bull we "see" no simple chronicle of slaughter in the abbatoir, but of the daily victory of the SOL INVICTVS over darkness. Christian theology revels in the irony of the conquest of death through death-and-resurrection. We find this triumph sung in the 11th century Roman Easter Sequence, Victimae Paschali, in words echoing the martial spirit of Christianity, the Church Militant, in feudal Europe:

> "Mors et vita duello conflixere mirando,
> Dux vitae mortuus regnat vivus".

'Death and life clashed in stupendous duel; the Duke of Life, dying, living reigns'. Christianity, too, had its own "cult of weapons". Down to modern times we find such traces as the 'sword Mass'/Messa della Spada celebrated, for example at Cividale. Scottish, Irish and other traditions have conserved sword dances that have associations with fertility ritual. The military wedding, with its cordon of officers flanking the bridal pair with unsheathed, naked swords erect, seems a fossilized moment of the Bronze Age in our own midst. In Tibetan and Indic traditions the victory of life over death is celebrated in the theme of the "death-killer" Yamantaka (Figure 17). God Shiva, in athletic standing coitus with his goddess Parvati, is also a public image, where in the West the union of man and woman, purportedly elevated to a sacrament, is far more a tabu subject relegated to the boudoir or reviled as pornography. In this Indic cosmology, the woman is no demure Victorian lady, no "passive principle". It cannot be denied that such a healthy naturalistic attitude continued in the West despite a millennium and a half of Catholicism, then Reformation and Puritanism. The latter and their Catholic clones, the Jansenists, were forever excoriating the Church for tolerating the practice of heathen ways in practices such as the Maypole festivities or the sexual license extended to the young at the old Irish wake. For these as for the society whose records we have in the carved rocks of the Val Camonica "the meaning of life" was to live it,

Figure 18.

Bronze Yamari

Yamari is a form of Yamantaka, one of the great protector deities of Buddhism in Tibet. His name means 'foe of Yama' (the ancient Indian god of death). He carries a skull-topped wand and a blood filled skull cap and embraces his female partner. Both figures are gilt and profusely ornamented with turquoise and coral. Tibetan, 15th century AD. Height 21.5 cm. O.A. 1880 - 125.

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to conquer death through the act of life. As theirs was a martial society their metaphors for the miracle of thwarting death are the implements by which a warrior-farming folk lives, ax and helve, weapon and sheath, blade and haft. This rock art attests their veneration of the source of life seen as the clash and thrust of battle, even of knife and wound. Its fruit, paradoxically, is not death, but life. This is the meaning of the "cult of weapons" so clearly delineated in the carved rocks and in the languages we still speak.

Notes

1. This report is part of a much larger project aimed at correlating the data of lexicology/etymology, archeology, and ethnography. My earlier work on neolithic antecedents of the Bronze Age material dealt with here can be found in Maher 1977 and 1979.

2. Newer Slavistic work of high quality not usually available in the West includes Ivanov-Toporov (1974) and Trubachev (1976-79).

3. The very term veneration, e.g. of the cross of Jesus, cloaks a pagan allusion to VENVS ('of Venus' VENERIS) used in Latin authors to mean 'physical love, sexual act, appetite, grace, sexiness, lust'. This term is cognate with German *Wunsch*, English *wish*.

4. This is one of the most important principles in reconstructing prehistory, linguistic or otherwise. A telling example is provided by the anomaly of the Italian phrase *sa di pesce*, which is effectively translated into English as 'it tastes fishy', but literally seems to say 'it "knows" of fish'. Spanish has *sabe de pescado* for the same; and a colonialist rebuke in Central America to a person who fails to exhibit Castilian rectitude is *sabe Indio'*, effectively, 'the Indian in you comes out'. *Sapere* in today's Italian generally equals English (to) *know*. However, it is the anomalous value of *sapere* as 'taste' which conserves the sense of Latin SAPERE, which was primarily a gustatory term and not intellectual. *Homo sapiens* 'intelligent man' is a modern coinage, attributed to Linnaeus (*Systema Naturae*, 1758). It remains to be seen if he himself first coined the phrase or took it from an earlier, now forgotten tradition. --Latin, nonetheless, knew the transferred meaning of 'understanding', as we see e.g. in SAPIENTIA 'wisdom'.

5. The displacement by [*wapJman* of the IE inheritance *wer* [= Latin VIR, Irish *fir*], I propose, involves the heavy incidence of *wer* for *wergild*, with ellipsis, in legal parlance. See Thorpe 1840, *s.v. wer-, wer-gild, wer-borh*.

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WINNER OF

1986 PRESIDENTS' PRIZE

ON RECONSTRUCTING VOICED ASPIRATED STOPS AND RETROFLEXED STOPS FOR PROTO-GYPSY

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INTRODUCTION

The word 'Gypsy' refers to an ethnic group which shares a common culture, defined historically, sociologically, or linguistically, although not all are necessary. A Gypsy must share a majority of the following features: a common religion, speak a Gypsy language, live in a particular place and have a Gypsy phenotype, as well as be recognized as a Gypsy by other Gypsies.

Romanes or Romani is the name given to the language of the Gypsies. Since the 1800's, scholars have been noticing similarities between Romanes and Indic languages and have been attempting to place Romanes more accurately within Indo-Iranian. "The development of Romani linguistics," by Ian Hancock includes a more detailed account than is possible here. However a brief overview is essential.

One of the greatest contributions was made by R. L. Turner, working in the middle half of this century. The major controversy in Gypsy linguistics has been whether the Gypsy language is of northwest or central Indic origin. Confusion occurred when some authors used the term 'northwest' to refer to the Dardic languages and others, to refer to Indic languages like Sindhi and Multani. Part of the confusion stems from controversy in classifying the Dardic languages. Some scholars place them within Indic, while others posit a third branch in Indo-Dardo-Iranic. Turner (1926) convincingly argues that Romanes is not Dardic, in origin. He argues that one must take into account the difference between conservation of a sound and innovation of a new one. After establishing this principle, Turner compares twelve varieties of Romanes with twenty-one modern Indic languages, three ancient Indic languages, and modern Persian, enabling him to compare Romanes to the northwest dialects on one hand and the central dialects on the other. Based on sounds which are represented in the Aśokan inscriptions but were later lost in the Prākrits, he concludes that the early speakers of Romanes lost contact with the other central Indic languages and migrated into the northwest dialect area before 250BC.

Turner divides Romanes into three branches: Dom or eastern Gypsy spoken in Syria, Lom or central Gypsy spoken in Armenia and Rom or western Gypsy spoken in Europe. It is from the word /rom/ 'man' in the European branch that the language name 'Romanes' generally associated with the Gypsies derives. For the purposes of this paper, the languages will be referred to by branch (Rom, Lom, Dom) and Gypsy will be used to indicate the language family. Rom and Lom share features which Dom does not.

FIGURE 1: PROTO-ROM FAMILY TREE

(After Kaufman)

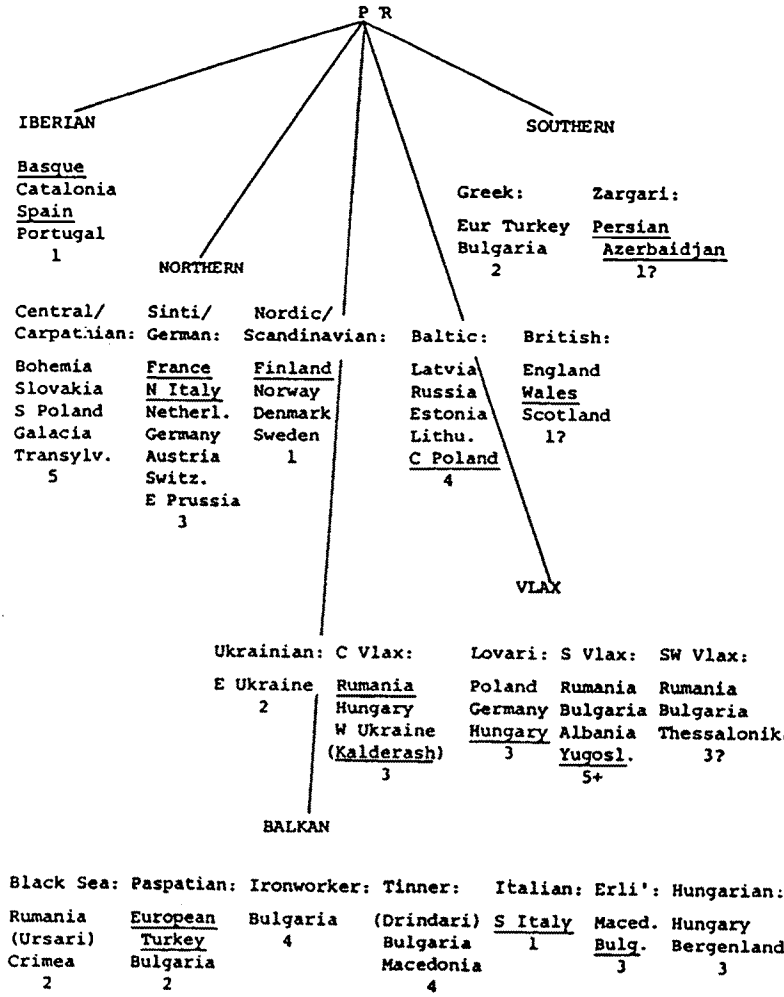

FIGURE 2

1 also	26 egg	51 leaf	76 see
2 ash	27 excrement	52 lie	77 sit
3 belly	28 eye	53 liver	78 sleep
4 big	29 fat	54 louse	79 small
5 bird	30 fat	55 male	80 small
6 black	31 fire	56 man	81 smoke
7 blood	32 fish	57 man	82 song
8 bread	33 five	58 man	83 steal
9 break	34 flesh	59 many	84 stone
10 breasts	35 foot	60 milk	85 sun
11 brother	36 full	61 moon	86 tail
12 cabbage	37 give	62 mouth	87 three
13 clean	38 go	63 name	88 thou
14 cold	39 gold	64 neck	89 time
15 come	40 good	65 neck	90 tongue
16 day	41 hair	66 new	91 tooth
17 die	42 hand	67 night	92 tree
18 do	43 head	68 nose	93 tree
19 door	44 hear	69 not	94 twenty
20 drink	45 horn	70 old	95 two
21 dry	46 hot	71 one	96 water
22 ear	47 house	72 person	97 we
23 earth	48 I	73 rain	98 white
24 earth	49 knee	74 red	99 who
25 eat	50 know	75 say	100 woman

In the years since Turner's article, scholars have attempted a similar classification of the dialects of the Rom branch of Gypsy. The classification of Kaufman (1979), a general analysis which attempts to correlate and integrate previous descriptive work, is the basis for my study. He concludes that the Gypsies were in the following countries, at the stated times, basing his decisions on borrowings from languages spoken there: Iran before 900AD --Persian and Kurdish; the Caucasus by 1050 AD --Armenian; Anatolia by 1200AD --Greek; southeastern Europe by 1300AD --Serbo-Croatian; and the rest of Europe during the 14th century. His classification system is presented in Figure 1. Under each dialect is an indication of the major places where it is spoken. The underlined dialects are those chosen for this study. A numeral indicates the known number of varieties of each dialect.

There were three primary criteria for choosing the dialects to be included in this study: representativity, depth of word lists and conservatism. In meeting the first criterion dialects were chosen from each of the five groups designated by Kaufman. However, since extensive work has not been done in all of the dialects, my choice was limited to those studies having word lists extensive enough to permit comparison. Finally, within groups having numerous studies the more conservative dialect was chosen. For example, I chose Welsh Romanes which is highly inflected over Anglo-Romani which has become pidginized.

Elsewhere I reconstruct the phonological system of Proto-Rom (PR) based on these fifteen dialects, later incorporating the Lom and Dom branches to reach a reconstruction for Proto-Gypsy (PG). The transcription systems for all the dialects are transposed into a system I designed to double as an orthography, as well. An apostrophe marks stress on the preceding vowel. The list of 100 words was chosen to include all the possible sounds, while still allowing manipulation with a large number of dialects, seventeen in all. In positing sound changes, words outside the list were utilized for comparison and testing. Some glosses like 'man' occur more than once where there is more than one root and a slight difference in meaning. The three words for 'man' mean 'non-Gypsy man,' 'mankind or male,' and 'Gypsy (man)'. The word list is included as Figure 2.

PROTO-ROM

I show later that voiced aspirated stops and retroflexed stops can be reconstructed for Proto-Gypsy. First, however, it is essential to examine the reconstructions for Proto-Rom on which they are critically based. In Figures 3 and 4 I present representative data from ten of the fifteen dialects. The chart has divisions for each of the five sub-groups posited by Kaufman: Iberian, Northern, Vlax, Balkan, and Southern.

The data in Figure 3 leads to the reconstruction of voiceless aspirated stops in initial position for PR. Calo', Sinti, Xoraxano, and Paspatian all exhibit a majority of words without aspiration, while the remaining six dialects have at least five out of six words with initial aspirated stops. Given these facts, it is more likely that aspiration has been lost in a few of the dialects than that it has been innovated in the others. Calo' and Xoraxano are the only two dialects which show complete loss of aspiration. It is probably not phonemic in Sinti and Paspatian, but definitely is in Vlax, Southern, and the rest of Northern. Therefore, the words with initial aspirated stops have been reconstructed for PR: *phral 'brother', *pherdo' 'full', *thud 'milk', *thuv 'smoke', *kham 'sun', and *kher 'house'.

An internal reconstruction of the missing words in each dialect results in the following: CALO'-- *cupa 'smoke'; XORAXANO-- *tud 'milk', *tuv 'smoke'; ERLI'-- *kham 'sun'; PASPATIAN-- *tuv/suv 'smoke'; and ZARGARI-- *pherdo 'full'. In several of the dialects, the stop plus aspiration has apparently been reanalyzed, becoming an affricate in the Calo' word for 'milk' and the Eastern Baltic Rom word for 'brother'; a palatalized stop in the Xoraxano word for 'house'; and a sibilant which alternates with a stop in the Paspatian word for 'milk'. In the word for 'brother' Zargari exhibits an epenthetic vowel, presumably to break up the /ph/ plus /r/ consonant cluster.

VOICELESS ASPIRATES	11 'brother'	36 'full'	60 'milk'	82 'smoke'	85 'sun'	47 'house'	
Calo'	panal	perdo'	cuta	---	kam	ker	Iberian
Sinti/Manush	phral	pardo	tud	tup	kam	ker	Northern
Welsh R.	phal	phard-	thud	thuv	kham	kher	
E.Baltic R.	pšal	pherdo	thud	thu	kham	kher	
Lovari	phral	pherdo'	thud	thuv	kham	kher	Vlax
Kalderash	pral	pherdo'	thud	thuv	kham	kher	
Xoraxano	pral	perdo	---	---	kam	tyere'	
Erli'	phral	pherdo	thud	thuv-	---	kher	Balkan
Paspatian	pral	pherdo'	tut/sut	---	kam	ker	
Zargari	phora:l	---	---	thuv	kham	kher	Southern
PR	*phral	*pherdo'	*thud	*thuv	*kham	*kher	
	ph		th		kh		

FIGURE 3

Figure 4 presents similar data for the reconstruction of two different 'r' phonemes for PR. Rom retroflexed /ṛ/ occurs in all of the Vlax dialects, and in the Erli' dialect of the Balkan group. It is clear that retroflexed /ṛ/ cannot be derived from the other /r/ phoneme, since there is no conditioning environment which accurately predicts it in the Vlax words. The Erli' words may be explained in one of two ways. Either Erli' has both phonemes and the contrast between them has been neutralized in final position, /por/ 'belly' as opposed to /ṛom/ 'man', or the words with retroflexed /ṛ/ are borrowed from a Vlax dialect. I favor the first hypothesis, since any borrowing from Vlax would have to be so early as to make the sounds virtually native in Erli. Present-day Vlax exhibits retroflexed /ṛ/ also in loan words from several Slavic languages, as well as Swedish, Greek, Rumanian and Kurdish, which are not found in Erli'. However, the one instance of retroflexed /ṛ/ in Eastern Baltic Rom should be explained as a borrowing. Therefore, I posit that /r/ and retroflexed /ṛ/ have merged in all but the Vlax dialects and Erli', and that retroflexed /ṛ/ should be reconstructed in the following words: *poṛ 'belly', *baṛ 'stone', *ṛom 'man', *anṛo' 'egg', and *manṛo' 'bread', but not in *rat 'blood' and *sero 'head'.

The reconstructions in Figure 4 are more complex than those in Figure 3, since the majority of the dialects do not have retroflexed /ṛ/. In initial and medial position there is corraboration of the Vlax evidence by that in Erli'. However, in final position the reconstruction must be done on a parallel with the initial and medial, since there is less evidence. The word for 'stone' only has the three Vlax dialects attributing retroflexed /ṛ/, while the word for 'belly' has only one instance, due partially to lack of data and partially to neutralization with /r/ in final position noted above for Erli', but also occurring in Lovari.

TWO "R" PHONEMES	3 'belly'	84 'stone'	58 'man'	26 'egg'	8 'bread'	7 'blood'	43 'head'	
Calo'	poria po	bar	rom	anro'	manro	rati'	šero	I
Sinti/Manush	per	bar	rom	yaro'	ma:ro'	rat	šero	N
Welsh R.	---	ba:r	rom	yaro	ma:ro:	rat	šero	
E.Baltic R.	per	bar	rom	yanro/yaro	maro	rat	šero	
Lovari	pur	bar	rom	anro	manro	rat	šoro'	V
Kalderash	por	bar	rom	anro'	manro	rat	šero	
Xoraxano	---	bar	rom	---	marno	rat	šoro	
Erli'	por	---	rom	aro	maro'	rat	šero	B
Paspatian	bor	bar	rom	vanro'	manro'	ratt	šero'	
Zargari	---	bar	ro:m	vanro	maro	ra:t	šoro	S
PR	*por	*bar	*rom	*anro'	*manro'	*rat	*šero'	
			r			r		

FIGURE 4

PROTO-GYPSY

The Dom and Lom branches are less adequately described than are those of Rom, leaving a large number of gaps in the data. However, the evidence which does exist is sufficient for making some tentative generalizations and conclusions. The data leading to a reconstruction of Proto-Gypsy is found in Figures 5 and 6. The words in parentheses represent use of an alternate dialect when forms were not found in the desired dialect. Those in square brackets represent a form which deviates from what is expected and is a supposed borrowing. Based on patterns in the other words, vocabulary items are reconstructed for Lom and Dom where there are gaps.

VOICED ASPIRATES	11 'brother'	36 'full'	60 'milk'	82 'smoke'	85 'sun'	47 'house'	--- 'hay'
Rom	*phral	*pherdo'	*thud	*thuv	*kham	*kher	*khas
Lom	phal	[por]	luth	*thuv	[gam]	khar	khas
Dom	bar	barda	(dugh)	*duma	gam	[ku'ri]	gas
PG	*bhral	*bharda	*dudh	*dhuma	*gham	*ghar	*ghas
Skt.	bhrātā	bharti	dugdha	dhūma	gharma	gṛha	ghāsa
	bh		dh		gh		

FIGURE 5

Figure 5 presents the Lom and Dom data which corresponds to the Rom data in Figure 3. A reconstruction for PG is proposed and compared with the Sanskrit cognate. In general, Lom patterns with PR in having voiceless aspirated stops /ph, th, kh/, while Dom exhibits voiced unaspirated stops /b, d, g/. I have reconstructed

the voiced aspirated stops /*bh, *dh, *gh/ for PG. The Rom and Lom reflexes are derived by devoicing and the Dom by loss of aspiration.

There are several exceptions to the general patterning described above. First, Lom /por/ 'full' and Dom /ku'ri/ 'house' are probably not cognate with the other words listed for 'full' and 'house' in Figure 5. It is clear from the other data that aspiration is expected in Lom and voicing in Dom. Dom /por/ could only be derived from PG *bharda as shown below if both an unmotivated vowel change and deaspiration rule were posited. In Lom, PG /d/ -> /l/ in every environment, so the lack of a reflex of /d/ could be the result of simplification of the liquid consonant cluster /rl/.

PR	*bharda	RULE
	*bharla	d --> l
	*bharl	a --> ∅/___#
	*bhar	liquid CC simplification
	*phar	devoicing
	*phor	vowel change ??
	*por	deaspiration ??
Lom	/por/	

The Dom form /ku'ri/ deviates from the expected /gar/ in several ways. First, the initial stop is voiceless rather than voiced. Second, there are two syllables where one is expected. Third, both vowels are unmotivated. The first vowel should be /a/, or at least unrounded. The final vowel must either be /a/ or deleted, rather than the marked final /i/. Lastly, word final stress is expected in native words.

The Lom form /gam/ 'sun' where /kham/ is expected can best be explained as a borrowing from Dom. This assumption is further supported by the word for 'hay': PR */khas/, Lom /khas/, Dom /gas/, PG */ghas/. The Sanskrit form is /ghāsa/.

The dental forms illustrated by 'milk' and 'smoke' are quite interesting. The Rom form */thud/ 'milk' is derived from PG */dudh/ by fronting of aspiration and subsequent devoicing. The fronting of aspiration was first noted by Sampson (1926:31,40) who calls it metathesis or transfer of aspiration. This is the application of a rule which fronted aspiration in certain environments.

The Lom form /luth/ 'milk' is transparent once the change from PG /d/ -> Lom /l/ mentioned above is made, yielding */ludh/. Since there is not an initial stop, the aspiration cannot be fronted. However the voiced aspirate is devoiced as elsewhere in Dom, yielding /luth/. The Dom form appears to have a form /dugh/ as its source, similar to Persian 'dugh' [duɣ]. First, the final voiced aspirate is a velar rather than the expected dental. Second, the voiced aspirate remains aspirated, but Dom regularly deaspirates. The expected Dom form would be */dud/. Thus, the PG form */dudh/ has been replaced by */dugh/.

In spite of the lack of forms in Lom and Dom, I have reconstructed PG */dhuma/ 'smoke' by analogy to corresponding

sounds, all of which are not presented here. I also reconstruct the Lom form */thum/ and the Dom form */dum(a)/. It is further possible to reconstruct a pre-Gypsy form */duddha/ between Indic (Sanskrit) dugdha and PG */dudh/ in which there is assimilation of /g/ to following /dh/, yielding /ddh/.

Two retroflexed stops, /ṭ/ and /ḍ/, have been reconstructed for PG. Figure 6 sets forth the data which support this reconstruction. The words for 'blood' and 'head' with reflexes of PG /r/ are included as contrastive evidence, due to the two 'r' phonemes in PR. The retroflexed /ṭ/ occurs on the surface in Dom, as /r/ in Lom and as retroflexed /ṛ/ in Rom. The retroflexed /ḍ/ does not occur on the surface, but can be reconstructed, based on what is known about the phonologies of the three branches. The two words each for 'belly' and 'stone', from two dialects of Dom, show the parallel between PR /ṛ/ and retroflexed stops in Sanskrit. Therefore, in the words for 'man', 'egg', and 'bread', a retroflex is also expected. It has also been demonstrated that PG /d/ → Lom /l/, so a voiced stop is expected. Dom gives the clinching evidence that this voiced retroflexed stop is /ḍ/ in the form for 'man' /dom/. The other two Dom forms, /ana/ 'egg' and /mo'na/ 'bread' have reduced the nasal plus retroflexed stop to a simple nasal and the evidence for retroflexed /ḍ/ is lost.

RETROFLEX STOPS	3 'belly'	84 'stone'	58 'man'	26 'egg'	8 'bread'	7 'blood'	43 'head'
Rom	*poṛ	*baṛ	*ṛom	*anṛo'	*manṛo'	*rat	*šero'
Lom	per	var	lom	anlu'	malav	---	sis
Dom	beṭas pe:t	waṭ wuṭ	dom	ana	mo'na	---	siri sura:t
PG	*peṭ	*vaṭ	*ḍom	*anḍa	*manḍa	---	*šira
Skt.	peṭa	vaṭa	ḍoma	aṇḍa	maṇḍa	rakta	śira
	ṭ		ḍ			r	

FIGURE 6

CONCLUSION

On the basis of the data presented above, I conclude that Proto-Gypsy has both a voiced aspirate series and two retroflexed stops. These are both features of Indic at the time the Gypsies are assumed to have left Central India. The phonological system of PG is more conservative than the Prākrits with regard to these features, which may suggest that PG split from Indic prior to the development of the Prākrits. This hypothesis needs further research before definite claims can be made.

Further research is also needed in other areas of Gypsy language studies. Utilization of linguistic methods to date the separation of Proto-Gypsy from the rest of Indo-Iranic, for example. More reconstruction could be done by expanding the number of words or the number of dialects included. There remains a substantial amount of descriptive work on the dialects as well as a published categorization of all the known dialects by phonological,

morphological and syntactic features. The Lom dialects have been particulary neglected. Some of the dialects could also be investigated for features of a "dying" language or to study the effects of contact between the Gypsy langages and their host languages.

Several factors have led to the lack of attention to Gypsy studies, in spite of the fact that it has been known for some time that Gypsy is an Indo-European language. First, much of the information about Gypsies and Gypsy language has been inaccurate and subject to stereotyping. Second, there are few opportunities to learn one of the Gypsy languages. Although I have called them dialects in this paper, for the most part they are not necessarily mutually intelligible. And finally, research is often published in journals specifically dedicated to the study of Gypsies, for example the Journal of the Gypsy Lore Society in Great Britain, Etudes Tsiganes in France, and Lacio Drom in Italy. Such a practice leads to isolation and lack of awareness of the data on the part of non-subscribing linguists. Turner's inclusion of Gypsy forms in his Comparative Dictionary of Indo-Aryan in 1966 was a step in the direction of making Gypsy linguistics more generally available.

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II

GENERAL LINGUISTICS

TOWARDS A FUNCTIONAL-STRATIFICATIONAL LINGUISTICS

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Functional stratificational linguistics (FSL) is similar to both cognitive-stratificational linguistics (C-SL) and to Paris School functional linguistics (PSFL). It is perhaps innovative in no respect; almost all of its features are found in either C-SL or PSFL or both. Unintentional innovations do arise, however, out of necessity in the act of combining the two approaches. Some features of F-SL may be more directly from dependency grammar, systemic linguistics, or (two-cell) tagmemics.

F-SL is much like the most familiar version of C-SL. Both have four strata, and the strata connect conceptual correlations and phonic correlations. Each Xemic stratum contains Xemes and Xons; Xons may be viewed as components of Xemes, although this is less clear in the inner strata than in the outer strata bordering on extralinguistic correlations.

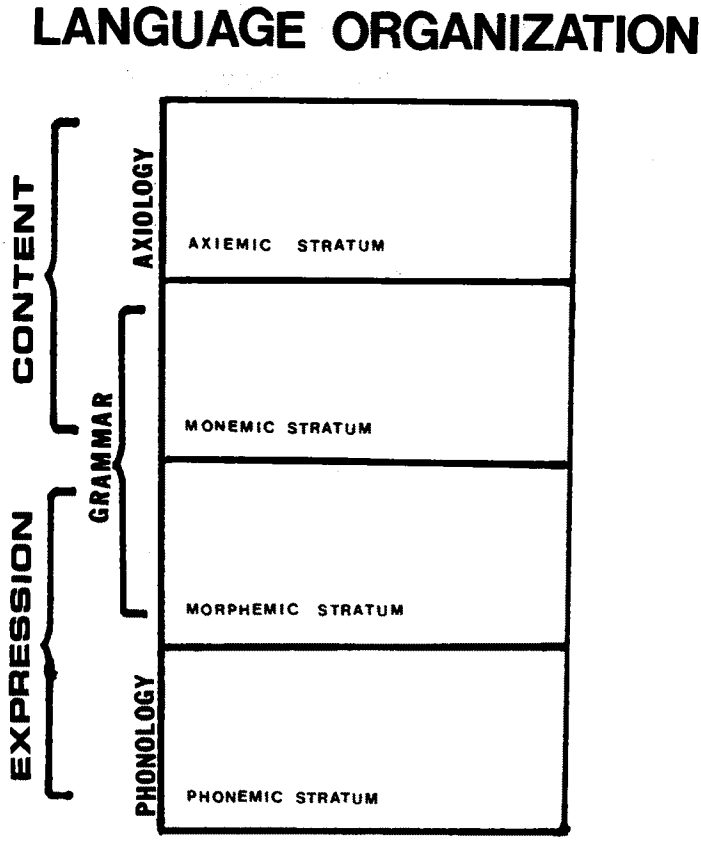
F-SL is much like PSFL in that syntax, the monemic stratum, is the level of the lexico-grammatical choice. The original intent was to borrow syntax in toto from PSFL, and only necessity has resulted in some modifications. PFSL syntax is non-linear, and syntactic non-linearity in F-SL syntax is basically adhered to. Within single predicate-headed structures and their constituents, non-linear syntax presents no problems; on the contrary, it avoids many unnecessary complications of models which use pre-morphemic linearization. In combinations of predicate-headed structures, however, the linear order is often a signal. In the English "I picked up a cookie and ate it," the order of "picked up" and "ate" is related to the chronological order of the events; "I ate a cookie and picked it up" would be semantically incongruous. It is clearly not the role of the morphotactics to recognize semantic incongruities. Within predicate-headed structures, or clauses, the morphotactics must assign a proper order based on a specification of syntactic function; similarly, function specifications may be applied to constituents of coordination and apposition structures and the complete non-linear nature of the monemic stratum is restored.

F-SL differs from C-SL in several critical respects. The four strata of F-SL are divided into two

planes: content and expression. The content plane contains the sememic, or axiemic, stratum and the monemic stratum. The expression plane contains the morphemic and phonemic strata. In C-SL, it is not clear at what point linearization occurs. Earlier C-SL practice, in which linearization is found in the semology in virtual contact with conceptual correlations, seems to have largely given way to a non-linear semology which is contiguous to a largely linear lexology. In F-SL, non-linearity of the content plane and linearity of the expression plane are assumed. A further distinction between F-SL and C-SL is the relations of Xemes to Xons on the content plane. In contrast to C-SL, in which Xons are always closer to phonic correlations than the Xemes of the same stratum, F-SL Xons are in all cases closer to the nearer extralinguistic correlations. In C-SL, the semon <mare> corresponds to the sememes <equine>+<feminine>; in F-SL, the axieme <mare> corresponds to the axions <equine>+<feminine>. Axions are semantic distinctive features just as phonons are phonetic distinctive features. In the F-SL morphemic stratum, a process of allomorph specification is required between morpheme and morphon, for F-SL morphemes correspond to C-SL lexons; no similar process of "allomonic" specification seems to be required in the monemic stratum. An inherent difference between the content and expression planes is assumed to account for this apparent asymmetry. The F-SL division of language into two planes with two strata each is shown in Fig. 1.

Another very important difference between C-SL syntax and F-SL syntax is that the former is a constituency syntax while the latter is a dependency syntax. Some modifications are thus required in the line-and-node notation system. The C-SL triangular AND node is not appropriate to display dependency struc-ture, so a new syntagmatic node is required for the mo-nemic stratum, possibly also for the axiemic stratum. For the paradigmatic, or OR, node, no modification is needed. A hexagonal syntagmatic node has been adopted for dependency structures. The governor, or head, alone extends from the lower side. Expandable dependents extend from the lower right side; unexpandable dependents, or modalities, extend from the lower left side. All are unordered. In addition, syntactic function is treated like the modalities and emerges from the lower left side. The higher connection extends from the upper side, but two sides remain unused. A probable change under consideration would put the function specification, a requirement for every node, at the upper left side and divide the expandable dependents into complements (nuclear dependents) and adjuncts (peripheral dependents); complements would be at the lower right

side and adjuncts at the upper right.



PLANES AND STRATA

FIG. 1

F-SL has a string-constituent morphotactics restricted by the lack of discontinuous constituents. Monemic function specifications apply equally to the morphemic realizations, so re-specification of function on the morphemic stratum would be superfluous. Additional complications allowing re-joining of non-contiguous constituents in the morphemic notation system are unnecessary. The F-SL morphemic stratum is thus quite similar to a systemic or a two-cell tagmemic grammar, but only to the extent that constituents are continuous.

Unlike tagmemic and systemic grammar, F-SL grammar is not a fixed-hierarchy system. There is no concern with whether such forms as English ‹another› or Spanish ‹porque› are one word or two. The concern over whether sentence and clause are two different ranks of grammatical structure or only one is partially, but only partially, eliminated. Just as there is a distinction between sentence-dependent adverbs and verb-dependent adverbs, there may also be a distinction between sentence-dependent adverbial clauses and verb-dependent adverbial clauses. If certain non-independent clauses, such as conditionals, are determined to be dependent on a higher node, such a node may be added with the main clause extending from the lower side and the conditional from the right side.

The cohesive features of a monemic choice are a concomitant part of a single choice. Such cohesive features, such as gender agreement, do not represent separate monemes and are not shown in PSFL visual representations of syntactic structure. In a stratified model, however, all information must be supplied which is required for a proper morphemic realization. The unordered triangular AND node is thus reintroduced into the F-SL node-and-line notation system to allow separate specification of a lexical item and its cohesive features. An unordered triangular node governed by a hexagonal node is used, therefore, to separate parts of a single unit of choice.

F-SL grammar may be viewed as a bistratal three-cell tagmemic grammar. The three cells are slot, class, and cohesion; the notion of emic role is rejected. The two strata dividing grammar into content grammar and expression grammar are compatible with the concept of deep and surface grammar. The lack of a fixed hierarchy in F-SL grammar produces itself no substantial difference.

Goal priority is different in F-SL and C-SL. Cognitive goals are primary in C-SL, as the name properly implies. In F-SL, on the other hand, typological goals are primary. The application of the F-SL model for cognitive linguistics is not, however, excluded; it is secondary though to concern for language typology.

The bistratal functional grammar of F-SL is a model for cross-linguistic grammar. An evaluation procedure based on a node-line count of a given fragment of grammar of a given language is thus rejected. Intrastratal theory in F-SL is designed to apply equally to all languages, and so likewise to all speakers. Grammatical categories include universal categories found in all languages and potential categories found in one or more languages. The universal grammatical categories are defined in terms of semantically-characterized pro-

totypes (Blansitt 1973:2); some of the potential categories may be defined in the same manner.

Some of the categories examined in detail by many traditional grammars are totally excluded in contemporary descriptions. Traditional grammars generally contain inventories of the meanings of case affixes and/or adpositions; syntactic semantics, like lexical semantics, is apparently left to the dictionary compiler by the practitioner of modern grammar. Syntactic semantics is indeed a part of the semology, or axiology, but exclusion of syntactic semantics from morphosyntactic descriptions is unjustified. Some syntactic phenomena, including the order of subclasses of descriptive adjectives in English and some other languages, can only be explained in terms of semantic conditioning.

An adequate model of cross-linguistic grammar must contain an adequate inventory of semantic roles. What will constitute adequacy in the semantic-role inventory? An inventory of all the meanings marked by different function markers in one or more languages of the world will be the adequate semantic-role inventory. A smaller inventory would be insufficient; a larger inventory would be unnecessarily inflated. The cross-linguistic semantic-role inventory will probably contain more than one hundred and less than three hundred roles.

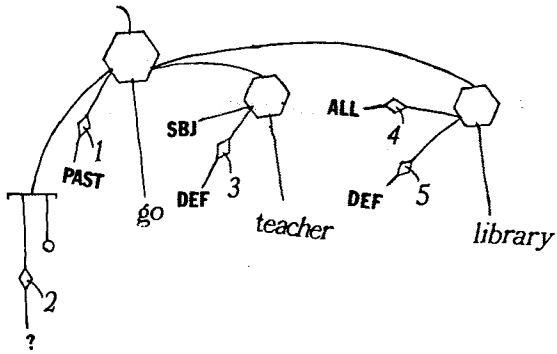
The semantic roles cluster around some cardinal points and form semantic zones, a term, "zones sémantiques," used by Claude Hagège (1982:42-43). There are undoubtedly semantic micro-zones expandable into macro-zones. The merger of ablative and genitive in Western Romance represents the merger of at least two macro-zones. Cross-linguistically, a micro-zone of semantic roles includes only roles which, at least in those languages which use adpositions or case affixes as function markers, tend to be marked identically, but absolute cross-linguistic identity of semantic roles is not possible; if separate meanings can be assigned but no language marks them differently, then there is only one semantic role. Simple adpositions generally occur as realizations of a number of different functions and roles, while co-verbs as function markers are generally restricted to a micro-zone or only a portion thereof. Adpositional synthemes, or compound adpositions, may be more restricted than co-verbs.

An exhaustive cross-linguistic study of the axiology of modalities or their morphemic realizations is also needed. A framework is required within which the axiology of such verb modalities as tenses, aspects, and modals can be rigorously explained. The same is true of such noun modality realizations as the definite article. In some languages, including English, a defi-

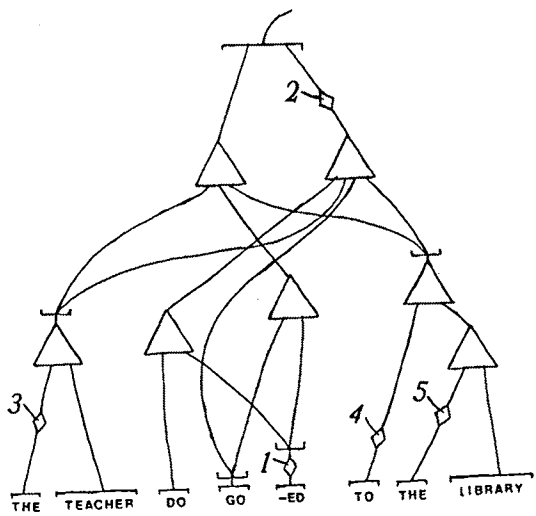
nite article is used with a closed class of nouns as a pseudo-definite article; in such cases, that subclass of nouns will apparently have to be stated in a list. The notational system of F-SL, applied to grammatical fragments of a given language, is most revealing in the bistratal trace. It may be used to show one monemic structure corresponding to one morphemic realization. More interestingly, it may illustrate a single monemic structure corresponding to multiple morphemic realizations, as in Figs. 3 and 4, or to show related structures, such as assertive and interrogative, as in Fig. 2. It can also be used to illustrate grammatical ambiguity, one morphemic structure corresponding to two or more monemic realizates.

Figures 2, 3, and 4 are bistratal traces. Figure 2 is a bistratal trace of ‹The teacher went to the library› and its corresponding interrogative, ‹Did the teacher go to the library?›; selected intrastratal relations are shown by numbers. Figure 3 shows four morphemic realizations for one Mapuche monemic structure: ‹Kɨmelay mi kɨpalel chi poñɨ›, ‹Mi kɨpalel chi poñɨ kɨmelay›, ‹Chi poñɨ mi kɨpalel kɨmelay›, and ‹Kɨmelay chi poñɨ mi kɨpalel› "the potatoes you brought are not good". Figure 4 illustrates three morphemic realizations of one monemic structure: ‹If Bill comes late, we will not see him›, ‹If he comes late, we will not see Bill›, and ‹We will not see Bill if he comes late›; it does not show the marginal, but possible, ‹If Bill comes late, we will not see Bill›, which corresponds to the same monemic structure. Assignment of endophoric pronominal realization has to be a function of the morphemic stratum; if shown in the monemic structure, then two separate monemic structures would be required for Figure 4. If only one monemic structure is allowed for stylistic variants, those which are semantically and pragmatically alike and contain the same lexical items, then the sentences belonging to Figure 4 must correspond to one and only one monemic structure. Selective interstratal connections are shown in Figure 4.

The nodes of C-SL may either face upward, towards conceptual corelations, or downward, towards phonic correlations. The hexagon is the same viewed from the top or the bottom. If necessary, a downward or upward pointing arrow can be shown within the node. There is, however, a lack of evidence to show that the decoding operation is anything other than the mirror image of the encoding operation, at least on the monemic stratum.



SYNTAX



MORPHOLOGY

FIG. 2

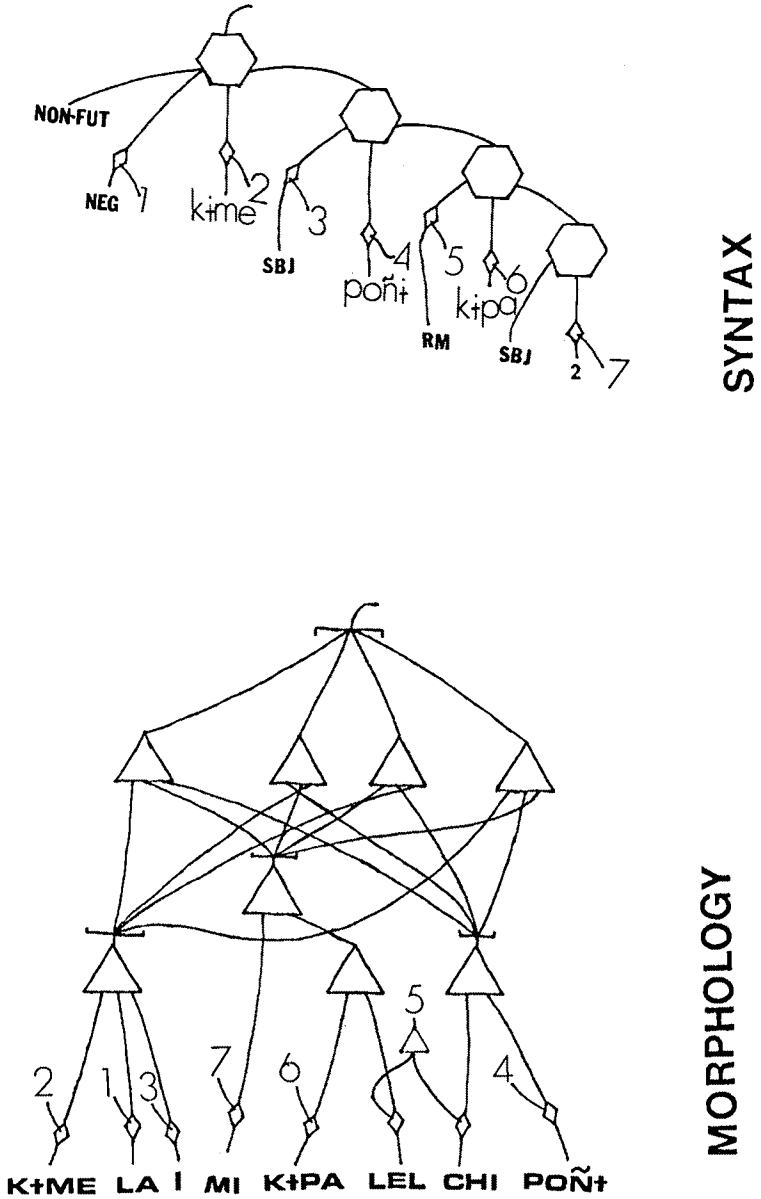

NON-FUT
NEG
1
k+me
2
SBJ
3
poñ+
4
RM
5
k+pa
6
SBJ
2
7
SYNTAX
2
1
3
7
6
5
4
K+ME
LA
I
MI
K+PA
LEL
CHI
POÑ+
MORPHOLOGY

FIG. 3

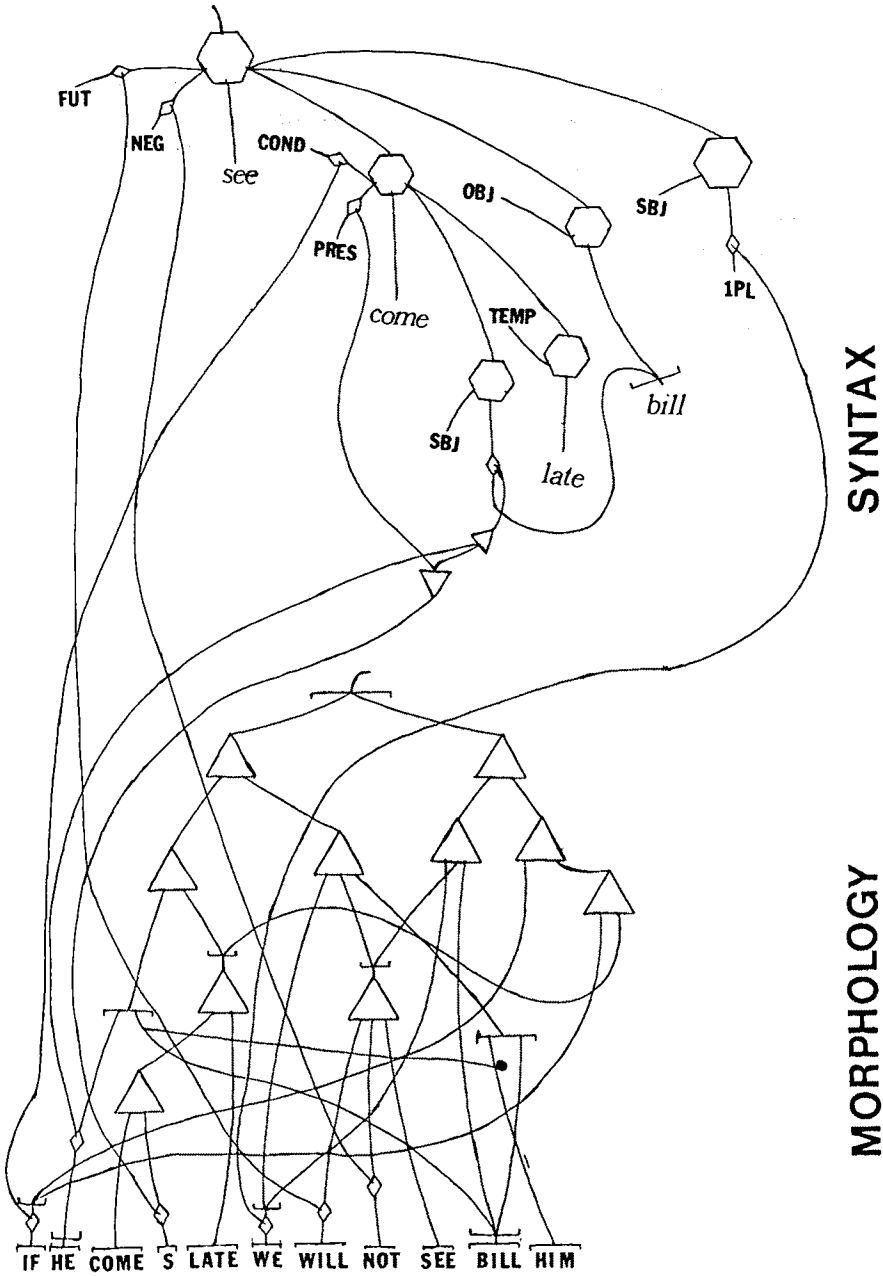

FUT
NEG
see
COND
PRES
come
OBJ
SBJ
1PL
TEMP
bill
SBJ
late
SYNTAX
MORPHOLOGY
IF HE COME S LATE WE WILL NOT SEE BILL HIM

FIG. 4

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THEORETICAL MODELS FOR THE STUDY OF NEW VARIETIES OF ENGLISH

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The description of 'new' varieties of English or the varieties used in newly independent countries such as India, Africa, the Philippines, Singapore and Malaysia, has been the subject of numerous publications in recent years. (See, for example,Pride (ed.) 1982, Platt, Weber and Ho 1984, Kachru (ed.) 1982, and journals such as English Worldwide and World Englishes). While these publications cover a wide range of topics from phonetics and phonology, through sociolinguistics, to lexis and syntax, hardly any attempt has been made to evaluate the theoretical assumptions made in them.

Two of the most common assumptions are (1) that these new non-native varieties are 'deviant' or 'different' from native English (Tongue 1979, Crewe (ed.) 1977, Kachru (ed.)1982, Tay 1982) and (2) they are comparable to a post-creole continuum (Platt and Weber 1980). These theoretical assumptions fail to characterise (1) the distinctiveness and (2) the systematicity of the varieties described.

In the description of 'new' varieties of English, certain minimal criteria must be met. Four such criteria discussed in this paper are: (1) intelligibility as perceived by other speakers of English, (2) creativity arising from the languages in contact, (3) code-switching and code-mixing and (4) pedagogical norms.

Studies on the intelligibility of non-native varieties of English have so far done little to increase our understanding of the nature of intelligibility as applied to the non-native varieties. The main problem with these intelligibility studies is that they have tended to focus only on those aspects of linguistic form which 'deviate' from native English, e.g. the emphasis on phonetic and phonological form in Bansal 1969 and Tiffen 1974 has blinded researchers to the crucial concerns of intelligibility. In my own study of the intelligibility of Singaporean English (see Tay 1986), it was quite clear that the problems of intelligibility that did occur had very little to do with differences between the phonology and syntax of British English and Singaporean English. Thus differences in vowel and consonant phonology and the absence of past tense marking in syntax did not hamper intelligibility. The major obstacles to intelligibility were in fact (1) discourse strategies, (2) lexical items, and (3) styles and registers.

As examples of (1), take the particles ah (used as a topic marker) and know and see (used as rapport markers). None of the British listeners ever heard these even after their presence was pointed out to them but all the Singaporean listeners did. As examples of (2), there were unfamiliar lexical items or collocations such as 'joss sticks', 'filial piety', and 'snap' photographs. As an example of (3) there was the use of a very colloquial word 'hubby' for 'husband' alongside a very formal one ('deceased' for 'dead') in an otherwise semi-formal context. All these cases presented problems of intelligibility to the British but not the Singaporean listeners.

Another characteristic of the new varieties of English is the creativity arising from the contact of different languages. Lexical innovations may take various forms, ranging from those which are recognisably English in structure but with some words from other languages, to those which are not even English in structure. An example of the first type is found in creative writing, e.g. in Lee Kok Liang's The Mutes in the Sun: 'The leaves of the tree rustled like a new sarung' and 'It was as soft as kapuk.' 'As soft as kapuk' would be meaningless to one who does not know what 'kapuk' is and has never felt it. But so would the expression 'as soft as eider down' to someone who has never seen or felt 'eider down'. Expressions such as those used by Lee show how new expressions can be put to good effect by making them more meaningful in the socio-cultural context of Singapore. Descriptions of new varieties of English which ignore non-English words will miss the creativity that arises from such 'mixed' expressions. As an example of the second type of lexical innovation - those which do not even have a basically 'English' structure, consider the following expressions which are used by English speakers when ordering tea in the less expensive 'canteens' in Singapore: teh-o, literally 'tea black' from two Teochew/Hokkien words, refers to tea with sugar but no milk', teh-kosong, literally 'tea empty' from the Teochew/Hokkien word for 'tea' and the Malay word for 'empty' refers to tea with milk but no sugar, teh-o-kosong refers to tea with neither milk nor sugar, and teh refers to tea with milk and sugar. It may be argued that these expressions are not English but as they are commonly used by monolingual speakers of English, they should be considered part of English discourse in Singapore. Lexical innovations may also be formed by a combination of English morphological structure and non-English words. Consider for example, kuning, a favourite word among national servicemen, homophonous with the Malay word kuning meaning 'yellow', but with quite a different structure and meaning. It is derived from the Hokkien word 'kun' meaning 'to sleep' and the English progressive aspect marker -ing, to mean 'sleeping'. Similarly, kachauration 'big bother, disturbance'and salarity 'big mistake' are formed from Malay kachau 'disturb' and the English noun-forming suffix -ation, Malay salah 'mistake, wrong' and

the English noun-forming suffix -ity. Yet another form of lexical innovation is the use of a Malay word and an English word together but with the latter bearing a different meaning from native English. One such expression is kena played meaning 'got played out' from the Malay word kena with all the implications of something bad having happened, and the English word played used to mean 'played out'.

Code-switching has been noted as an important aspect of the new Englishes. (See for example Kachru 1983: 193-207). Code-switching between the different sociolects in English from a formal lect to an informal one within the same discourse is found in native Englishes. However, to use the same method to analyse the types of code-switching and code-mixing that go on among multilingual speakers in multilingual communities where English is spoken as only one of several possible languages, is extremely misleading. Thus Platt's description in terms of a speaker 'dropping down' from the 'acrolect' to the 'basilect' when speaking informally is misleading and counter-intuitive. No Singaporean would ever mistake an educated English speaker speaking informally (whom Platt refers to as 'basilectal') for an uneducated speaker (whom he also calls 'basilectal'). They may share certain formal features but the similarity ends there. (For a fuller development of this argument, see Tay 1986:103-104). Platt's 'lectal continuum' also does not accommodate code-mixing which entails transferring linguistic units from one code into another (Kachru 1983: 194). From a monolingual English perspective, such 'mixing' may seem odd and haphazard, but from a multilingual or multidialectal viewpoint, various types of language or dialect mixes serve different functions and have different effects on the discourse. (Kachru 1983:194). Some of these functions, constraints, and effects, much neglected in descriptions of Singaporean English, will be illustrated below.

At its simplest level, code-mixing may involve inserting words, phrases and even complete sentences from a language other than the one being used. For example, if the speaker is speaking mainly English, he or she may insert expressions from one of several languages as in the examples below:

1. No, we only had the Lembaga Peperiksaan (Malay for 'Board of Examiners').
   (Lee Phaik See 1982: 116)
2. Noraini kaypo, (Hokkien for 'busybody') ah, (particle used in non-formal Singaporean English) complains one la.
   (Lee Phaik See 1982: 118)
3. Well, confirmed as a guru bahasa (Malay for 'language teacher').
   (Lee Phaik See 1982: 128)

In examples 1 and 3 above, it is quite clear that the

utterances are basically English in structure with Malay and Hokkien words mixed in. The use of 'a' and 'the' before the Malay words marks the entire discourse as predominantly English since Malay does not distinguish between 'a' and 'the'. However, in example 2, Noraini kaypo meaning 'Noraini is a busybody' is not so clearly English if one were to analyse the sentence in terms of Standard English which would require the verb 'is' between Noraini and 'kaypo'. But as most Malaysian/Singaporean speakers would drop the 'is' in informal conversation (a possible influence from the local languages - Chinese and Malay), there is little doubt that this sentence should be analysed as a mixture of English and Hokkien.

Not all types of code-mixing are, however, so simple. In the fragment of the text given below, the speaker is conversing with someone on the phone. Both the interlocutors are fluent in English, Hokkien and Mandarin.

Oh I see, quai bu de (Mandarin for 'no wonder').. wo xie ying wen bi jiao kuai (Mandarin for 'I write faster in English), gua sia eng boon luan ju tu, luan ju sia (Hokkien for 'when I write English, I simply scribble and I write carelessly') jiaru (Mandarin for 'if') move de (Mandarin particle) fast, bo teh kak o (Hokkien for 'not sure'). Duei bu chi (Mandarin: sorry). I got to go.

In the above text, the three languages are so well mixed that analysis becomes much more difficult. An analysis of the formal characteristics of the above could include the morphological and syntactic structures of all the three languages involved, which incidentally, are from quite different language families. But a more interesting analysis would be to show how code-mixing is used as a communicative strategy, as a device for elucidation and interpretation, to establish solidarity and rapport and so on. The linguistic, psychological and sociolinguistic implications of code-mixing and code-switching have yet to be fully investigated even between closely related languages. In a study of new varieties of English, these implications must be investigated if we are to understand the functions and forms of English used not in a static monolingual society but in a dynamic, multilingual one where English is only one of various possible codes to be chosen by the speaker in any one context. Unfortunately, the present publications on the new varieties of English have very little to say about this topic.

Finally, an adequate description of the new varieties of English cannot afford to remain silent on the question of pedagogical norms. For multilingual communities, there is undoubtedly genuine creativity arising from languages in contact, but there is, at the same time, the need to distinguish

between the mature speaker of English whose command of the language has stabilised and learners who are still being taught the language formally. Platt, Weber and Ho (1984) appear to overlook this completely: the highest level of proficiency in English in their samples of written educated Singaporean English is that of some Secondary Four students writing essays for the authors impromptu. The results are naturally as misleading as analysing American English in terms of the English of Grade 12 students. In discussing pedagogical norms, descriptions of non-native varieties of English should deal with such questions as: When is creativity genuine as in the examples given above? When is it simply the result of a lack of proficiency in English? Is the student who writes about 'the exhausted fumes of the car' instead of 'the exhaust fumes of the car' in an essay about traffic jams to be credited with creativity in the implication that even the fumes coming out of the exhaust are exhausted, or is he/she simply ignorant about certain noun formations in English? Presumably, usage in the rest of the essay will help to answer this question. But my point is that such questions are seldom asked. It is generally assumed that formal characteristics are the important ones. Another question relevant to the discussion of pedagogical norms is: Should the rhetorical norms of native Englishes be used in evaluating written non-native Englishes? Should written English in multilingual communities be completely free from cliches for it to be judged 'good writing'? Or should it be allowed to incorporate some of the literary traditions of the languages spoken in the area, such as those of the Chinese and Indian languages where the use of proverbs and idiomatic expressions is considered the hallmark of learning?

Let me now return to the two major failures in the existing models for the study of new varieties of English. It has been pointed out in the opening paragraphs that these models fail to highlight the distinctiveness and systematicity of the non-native varieties of English. I will now propose a dynamic, interactive, multidimensional model which should overcome the shortcomings of unidimensional models such as that of the lectal continuum popularised by Platt and Weber 1977.

The distinctiveness of Singaporean English is perhaps most evident at the level of discourse. The use of particles such as la, what, man, ah, and ha is characteristic of all Singaporean speakers in all contexts except the very formal ones. Speakers irrespective of their language background, type and level of education use these particles. As none of them are used with the same meaning in any other languages, or learner languages (also known as interlanguages) or pidgins or creoles, they may be said to be truly distinctive of Singaporean English. The use of these particles is rule-governed and extremely complex and cannot therefore be treated merely as

'empty slots' and 'sentence fillers'. For a description of one such particle, la, see Richards and Tay 1978. At the level of syntax, there is very little that marks the Singaporean variety of English as being dinstinctively Singaporean. The syntactic features mentioned by Platt, Weber and Ho (1984) such as the deletion of d/t after consonants in past tense marking, the absence of the third person singular present tense marking and the omission of articles do not make Singaporean English distinctive because (a) not all speakers have these features and (b) these features are also found in many 'learner' varieties of English and English-based pidgins and creoles. As pointed out earlier, lexical innovations incorporating words and expressions from Malay, Mandarin and Hokkien also give Singaporean English a distinctiveness not found in other varieties. These innovations as well as code-switching and code-mixing are not the result of lack of proficiency in the languages concerned and therefore cannot be equated with 'learner languages'. They are also not found in other countries. For example, code-switching and code-mixing between English and Mandarin may also be characteristic of speakers from China and Taiwan, and code-switching and code-mixing between English and Malay characteristic of speakers from Indonesia (if we regard Malay and Indonesian as dialects) but conversations which involve switches between a variety of languages such as Mandarin and Hokkien, or English, Hokkien and Malay, or English, Hokkien and Cantonese can originate only from Singapore and Malaysia. At the level of phonology, it is the intonation and rhythm more than the vowel qualities or consonant deletions that make Singaporean English distinctive. For example, some Chinese-educated speakers of Singaporean English share certain features with speakers of English from China such as the absence of the l/r and s/ distinction and Indian speakers from Singapore share some retroflex consonants with Indian speakers of English from India. Thus while segmental features help to identify a Singaporean speaker as Chinese, Malay or Indian, it is the suprasegmental features that give Singaporean English its distinctiveness in phonology. No Singaporean of Indian ethnic origin would ever mistake an Indian from India as Singaporean, nor would any Singaporean of Chinese origin fail to tell that another Chinese speaker of English is from a country outside Singapore - perhaps from China or Taiwan.

In order to characterise the systematicity of Singaporean English, we propose a dynamic, interactive, tri-dimensional model. This model is built on the dimensions of user, usage and use. The user dimension includes all the characteristics of each speaker that can possibly influence the type of English he/she uses. Of particular importance in the study of new varieties of English are:

1. Age: child or adult.
2. Language learning status: learner or mature speaker.

3. Language most used: at home, at work, etc.
4. Type and level of education: medium of education (English, Mandarin, etc.), last examination passed (Primary 6, O level, A level, University, etc.)
5. Language attitudes: degree of linguistic tolerance, attitude to language use in general, attitude to languages spoken in the community.

The usage dimension includes all the characteristics of Singaporean English as a code used for multilingual communication and not just the linguistic features which 'deviate' or are different from native Englishes. Of particular importance are:

1. Medium of communication: especially spoken.
2. Discourse: especially social rules of language use, concept of formality in language, communicative strategies, discourse styles, rhetorical norms.
3. Lexis: especially characteristic lexical innovations arising from language contact, culture-specific usage of words, the use of acronyms.
4. Syntax: especially the use of particles.
5. Phonology: especially suprasegmental characteristics such as intonation and rhythm.

The use dimension includes all the factors that make up the context in which English is used except for user characteristics which have already been dealt with above. Of particular importance are:

1. Domains and subdomains: especially family, business, friendship, education, religion.
2. Degree of formality: especially situations which have characteristics pertaining to all levels of formality: formal, semi-formal and informal.

To characterise both the distinctiveness and systematicity of Singaporean English, it is essential to consider all three dimensions in any single study. Some examples from the phonology of Singaporean English will serve to illustrate the importance of this claim. Along the user dimension, one needs to account for systematic differences between (a) the different streams of education, e.g. the absence of the distinction between [s] and [ ], [l] and [r] distinction is typical of the Chinese-educated but not the English-educated Singaporean, (b) the different ethnic groups, e.g. the presence of retroflex consonants is typical of Indian speakers, especially the less well-educated ones, but not of Chinese or Malay speakers, irrespective of their stream and level of education. If one were to describe the phonology of Singaporean English by using data from a limited number of speakers to represent a wide range of ethnic backgrounds, age, occupations, levels of education, (Platt and Weber 1980: 49), such systematicity would

not emerge. Along the usage dimension, certain aspects of phonology, such as vowel phonology, consonant phonology and rhythm require different modes of eliciting data. For example, in my own study of the phonology of Singaporean English, I have used word lists, prepared texts, interviews, conversations and other forms of spontaneous speech. Vowel phonology appears not to be affected by the mode of data collection: speakers had the same vowels whether they read words from a list, or were interviewed, or spoke spontaneously on a topic given to them. Consonant phonology, however, was affected. Some speakers had certain consonant clusters in the coda when reading from word lists and from a text but not when speaking spontaneously. As consonant deletion is systematic (there are phonological rules of consonant deletion in Singaporean English not found in native English), one can only arrive at these rules by presenting the speaker with lists of words in order to check for alternations which would take a very long time to surface in spontaneous speech. Along the use dimension, domains exert a strong influence on the phonology of Singaporean English. Thus the same speaker speaking what is always recognisably Singaporean English has a number of subsystems which he uses according to whether he is using English in a tutorial at the University or at home with his brothers and sisters. The subsystem used in the domain of education will, for example, have certain consonant clusters in the coda whereas the one used at home will not. However, word accentuation, rhythm and intonation vary from speaker to speaker but not within the same speaker in different domains.

In conclusion, the main advantages of the interactive, tri-dimensional model over models currently used, such as that of the 'post-creole speech continuum' appear to be the following:

1. It allows the investigator to choose modes of data collection most suitable to the area of Singaporean English investigated. If code-switching is the focus of the study, informal conversation between speakers who share more than one common language would be used to obtain the maximum amount of data as code-switching and code-mixing in Singapore (unlike the Philippines) is found only in informal contexts. On the other hand, if consonant phonology is the focus of the study, both word lists (to elicit the maximum amount of information about alternation) and spontaneous speech (to obtain data about consonant deletion) have to be used.
2. It accounts for the systematicity of Singaporean English: the existence of overlapping but clearly defined subsystems within a general system known as Singaporean English. Each speaker has a number of subsystems of phonology, syntax, and discourse (as one should expect in a multilingual community) which are used in predictable ways

depending on factors along the user, use and usage dimensions. The sum total of a speaker's subsystems comprises his/her overall system and the sum total of all the speakers' subsystems comprises the entire system of Singaporean English.

3. By postulating the existence of various subsystems, it is also able to separate the distinctiveness of Singaporean English (characteristics which distinguish it from other varieties of English) from sociolectal characteristics (characteristics which mark a person's ethnicity, type and level of education, occupational status and so on). The distinction is important in intelligibility studies: national intelligibility is important to every speaker of English in Singapore as English is widely used in the Republic; however, international intelligibility will be relevant only for those with a certain level of education, occupational status and so on.
4. This model is also more appropriate for the study of code-switching and code-mixing because it is not based on a monolingual English system of syntax, lexis and discourse. Each unit of discourse can be studied on its own and this is important in a multilingual community where strategies of code-switching and code-mixing depend not only on the structural constraints of the languages involved but also on rules of usage shared by the entire speech community.
5. Language acquisition strategies can also be seen in better perspective. By comparing the speech of a three year old with that of a mature speaker (instead of indiscriminately labelling both as Singaporean English speakers because they share certain common 'deviations' from native English), one can single out what are truly acquisitional strategies and what are stable characteristics of a new variety of English.
6. By making a distinction between the English used by mature speakers and that by language learners, pedagogical norms become clearer. For example, it will become quite clear what is truly 'fossilizable', what is considered an 'unacceptable accent' within the Singapore context and therefore to be considered a target for teaching and what is simply different from native English but generally acceptable within the context of Singapore.

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III

PHONOLOGY AND SCRIPTS

SYMMETRY IN SWABIAN UMLAUT PATTERNS

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Swabian is a West Germanic language spoken in the southwestern region of the Federal Republic of Germany. A branch of Common Alemannic, it occupies the northeastern sector of the Alemannic region and evolved as a separate language and culture beginning around the year 1200 (compare Krauss 1897/99), undergoing a series of vowel changes that culminated in the fifteenth century and that still demarks the Swabian reflexes of medieval Alemannic and of Middle High German in general (see Bohnenberger 1892).

Although it boasts a long and fruitful literary tradition, there is no standard literary Swabian language, and indeed there is not yet even a standard set of orthographic practices -- a task undertaken by this researcher and nearing completion. Thus, when we speak of the Swabian language, we are referring to a collection of dialects that differ mainly in their vowel systems. For example, MHG breit 'broad' is pronounced as [brǫəd] in the western and eastern regions, [brǫid] in the middle, and [braid] in the far northwest and southeast (compare Bohnenberger 1953).

In this treatment, I shall use the western dialect patterns recorded in Kauffmann (1890), Bohnenberger (1928), and Vogt (1979), as these most regularly reflect the patterns under consideration. Other dialect regions have similar patterns as well, although the innovative pattern is usually not as extensive or as pronounced in them. As for notation, I am using a broad, general transcription that reflects practices being developed in the standard orthography mentioned above.

The Traditional Patterns

In Table 1, we find the five traditional umlaut patterns found in Middle High German and their Swabian reflexes. As is well known, the umlauts developed in Old High German as anticipatory fronting in the stem vowel due to a high front vowel or glide in the following syllable (compare Holtzmann 1843, Russ 1978:56-58; also Kauffmann 1890:146-53). Of course, the Middle High German pronunciation is ascertainable only through spelling conventions and mistakes, though the only problematic pronunciation is that for the umlaut in pattern 5, which is written as öu, often as eu, and rarely as oi or öi (Wright 1955:9). As for the Swabian pronunciation, I have followed the practices of Kauffmann (1890), still probably the most widely known (and available) work on the Swabian sound system.

While Middle High German may have some inconsistencies (notably in patterns 4 and 5), the Swabian patterns have maintained a remarkable degree of symmetry within the system. Of course, patterns 1 and 2 re-

TABLE 1

Patterns 1-5

	Middle High German	New High German	Swabian	Orthography	Gloss
1	slac, slegel	Schlag, Schlegel	ʃlag, ʃlẹ:gl̩	slag, slẹgl	hit, hammer
2	hôch, ho͡ehe	hoch, Höhe	họ:x, hẹ:	hôh, he	high, height
3	hûs, hiuser	Haus, Häuser	həus, həisr̩	hous, heisr	house, houses
4	wuot, wüetic	Wut, wütend	wuəd, wiədẹx	wuad, wiadeh	fury, furious
5	louf, löufec	Lauf, geläufig	laọf, laẹfẹx	laof, laefeh	course, fluent

	Middle High German	Swabian
1	a - a͡e (a - ä)	a - ẹ/ẹ
2	o - o͡e (o - ö)	ọ - ẹ
3	u - iu (u - ü)	əu - əi
4	uo - üo	uə - iə
5	ou - öu	aọ - aẹ

flect the basic tendency of the vowel to move toward the front. When we direct our attention, though, to the rest of the patterns, which are all diphthongs, the symmetry of the system becomes more impressive.

In pattern 3, the schwa [ə] does not mutate, but the regular umlaut tendency is maintained in the other element of the diphthong. Here dialect differences must be pointed out. Vogt (1979:47) uses a fairly regular orthography that would indicate a pronunciation closer to [au] and [ei̯] for the nonmutated and mutated forms, respectively. In other dialects, the forms are recorded as [ou̯] and [ei̯] (see Haag 1898). In the standard under development, I have chosen the symbols ou and ei, for reasons that will be made clear in the conclusion of this paper.

In pattern 4, once again there is a schwa that remains unchanged in the mutation, and another element of the diphthong that umlauts from the high back vowel to the high front vowel. Unlike pattern 3, however, the positions in the diphthong of the central and peripheral vowels are reversed. It is noteworthy, however, that their mutation pattern remains the same, regardless of their position in the diphthong. In the orthography under development, I have chosen the symbols ua and ia to represent the nonmutated and the mutated diphthongs in writing.

Finally in pattern 5, we find once more a central vowel that remains unchanged, though this time it is a low central vowel [a] rather than the mid central vowel [ə]. Moreover, the back vowel also umlauts to the corresponding front vowel, although the vowels in question are high mid vowels rather than high vowels. In the standard orthography, I have chosen the symbols ao and ae for the nonmutated and the mutated forms.

Examining these patterns, we should immediately notice the symmetry involved in the mutation of the diphthongs. Regardless of the position within the diphthong, a central vowel remains unchanged. This places the entire burden of representing the umlaut upon the front and back vowels participating in the diphthong, and these noncentral vowels simply change symmetrically from their back to their front positions.

Of particular interest in variation, though, is still pattern 3. Regardless of what dialect variant we use, the symmetry of the umlaut pattern is maintained. In the pattern reflected in the notation of Kauffmann (1890), the only vowel available for umlauting is indeed fronted, as the central vowel remains unchanged. Thus, for example, the plural of [həus] 'house' is [həisr̩].

In the notation of Vogt (1979), in which [au] umlauts to [ẹi̯], the central vowel in the nonmutated form does indeed mutate to the position implied by pattern 1 -- from [a] to [ẹ]. Thus, for example, the plural of [haus] is [hẹisr̩]. While this may bring about a contradiction with the unchanging central vowels in the other patterns, it nonetheless maintains the independence of the two elements of the diphthong, as each changes to its umlaut form without regard for how the other is changing (or whether it is changing). Indeed, the contradiction between patterns 3 and 5 can readily and realistically be accommodated by attributing the lack of change for pattern 5 in the affected dialects to two factors: the essential dissolution of the diphthong if the central vowel were umlauted, and the articulatory proximity of the two elements in the diphthong (which, in fact, would lead to the first prohibiting factor).

In the remaining variant as recorded, for example, by Haag (1898) in the large region between the upper Neckar and Danube Rivers, the

symmetry is perhaps best maintained. In this pattern of change from [o̤u] to [e̤i], both elements of the diphthong take part in the front-to-back mutation characteristic of umlauting, and each element takes part in the umlaut mutation independently of the other. For example, the plural of [ho̤us] is [he̤isr̤].

Thus, no matter which notation we use, the basic symmetry of the diphthongal umlauts is maintained. In the cases of the diphthongs, one may take the usual vowel triangle and draw a verticle center line through the central vowel region. Those vowels that fall on the center (with the exception noted above) remain unchanged, while those vowels occupying spaces on the one side of the center line correspond in the umlaut patterns to vowels in precisely the same position on the other side, as illustrated in figure 1. This is, by the way, more symmetrical than the Middle High German (particularly with its variants in pattern 5); and it is far more symmetrical than the sole remaining diphthongal umlaut in New High German, in which Haus [haus] 'house' alternates with the plural Häuser [ho̤izʌ] (as noted in Table 1).

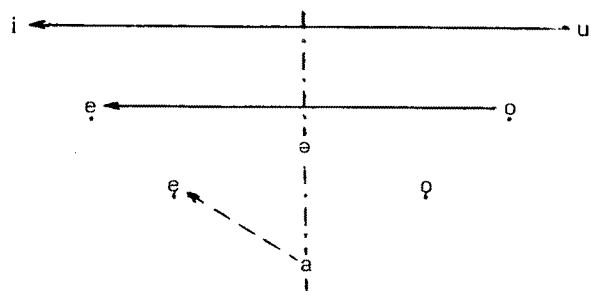

Figure 1: Patterns 1-5

The Innovative Pattern

In the western dialects and at least sporadically in others as well, a sixth umlaut pattern has emerged, as noted in Table 2. Where the descendant of Middle High German ei (when not derived from Old High German ai, which follows a different development entirely) is realized as the diphthong [ɔ̤ə], it undergoes a mutation to [ɛ̤ə] in those stems that are subject to umlaut -- for example, certain comparative adjectives, plural nouns, derivative nouns, diminutives, and the like. (On this point see especially Bohnenberger 1928:18, Vogt 1979:46-47, and various forms included throughout Fischer and Pfleiderer 1904/36, especially the entry under breit -- vol. 1, pp. 1390-91.)

This new umlaut pattern 6 is striking for two reasons: (1) its purely analogical development and (2) its adherence to the symmetry of the existing Swabian umlaut patterns. Clearly, pattern 6 is the result of anal-

TABLE 2

Pattern 6

Middle High German	New High German	Swabian	Orthography	Gloss
breit, breiter	breit, breiter	brǫəd, bręədr̩	brǫad, bręadr	broad, broader
weich, weicher	weich, weicher	wǫəx, węəxr̩	wǫah, węahr	soft, softer
heiʒ, heiʒer	heiß, heißer	hǫəs, hęəsr̩	hǫas, hęasr	hot, hotter
streich, streiche	Streich, Streiche	ʃdrǫəx, ʃdręəx	sdrǫah, sdręah	trick, tricks
breit, breite	breit, Breite	brǫəd, bręəde	brǫad, bręade	broad, breadth
leip, leibelîn	Laib, Laiblein	lǫəb, lęəble	lǫab, lęable	loaf, little loaf

	Middle High German	Swabian
6	-	ǫə - ęə

ogy, for there has been no phonetic justification for umlaut in the environments motivating the mutation for several centuries. Thus, the only phonetic pressure brought to bear on the new pattern is the tendency to adhere to phonetic alternations involving other stem vowels in a manner consistent with these other alternations -- and that is precisely within the realm of analogy.

As a creation of analogy, umlaut pattern 6 is a conscious development, as opposed to a mechanical one. That is, the speaker's implicit or explicit awareness of the morphological conditions participating in the umlaut patterns, of the phonetic consequences of these conditions, and of the applicability of similar phonetic consequences in the case of [ǫə] all conspire to lead the speaker deliberately to create the umlauted form [ę̯ə].

Moreover, the sensitivity of the speaker to these conditions and the conscious application of them in analogy are made possible through the regularity of the Swabian umlaut system -- through its symmetry. The regular, symmetrical correspondence between back and front, as illustrated in figure 1, is simple enough that the speaker can be aware of the grammatical functions implicit in vocalic frontness or backness.

Furthermore, let us recall those dialects in which [au] umlauts with [ęi]. It was suggested above that the umlaut of the central vowel could obtain in such instances (following the monophthongal pattern 1) because of the extreme height difference between the two elements of the diphthong, allowing them to operate in a more independent, monophthongal manner. Conversely, in these dialects the umlauting of the central vowel in pattern 5 would in effect be blocked because of the proximity of the noncentral element. Quite in accordance with this analysis, we may likewise conclude that in these dialects, the central vowel in pattern 6 is also blocked from umlauting, since after all the low mid back vowel is even closer to the low central vowel than is the high mid back vowel of pattern 5.

The role of symmetry in the development of the Swabian umlaut patterns can thus be seen as a strong force both in making the system more regular than its ancester (and the competing New High German system) and in directing the development of the innovative umlaut pattern 6. In effect, we find a center line directly through the central vowel portion of the vowel triangle, and the normal alternation pattern simply links elements symmetrically on either side of the center line. Only in the monophthong of pattern 1 and, in some dialects, in the central vowel of pattern 3 (where the distance between the two elements of the diphthong creates, in effect, a monophthongal pattern) is the symmetrical pattern at all changed. That this regularity should particularly be the case of diphthongs, is especially remarkable and especially illustrative of the force that symmetry has in the system. Including pattern 6, the symmetrical vowel triangle introduced in figure 1 may now be represented as in figure 2.

Conclusion: Symmetry in the Orthography

In the development of a standard Swabian orthography, the choice of orthographic symbols participating in the umlaut system should reflect

the symmetry of that system. That is, where the symmetry of the system might suggest one or another orthographic device, then certainly that suggestion ought to be heeded. This is particularly the case in the choice of symbols for the diphthongs participating in patterns 3 and 5.

Before dealing with the representation of these symbols, we must first establish the unstressed vowel. Due to several other factors in the sound system of Swabian, the lax mid central vowel [ə] is represented as a in the orthography. This actually follows widely accepted practice and is necessary since a slightly more tense variety close to the low mid front vowel [ę] and represented as e in nonstem syllables is needed for certain alternations (for example, the singular diminutive heisle 'little house, cage' is rendered in the plural as heisla).

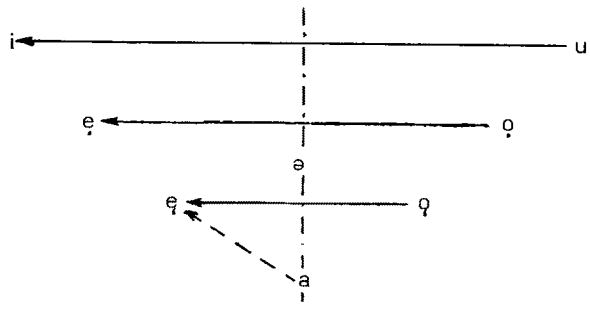

Figure 2: Patterns 1-6

With this in mind, we may proceed to the effect of the symmetrical patterning of the umlauts in patterns 3 and 5 on the choice of orthographic symbols. In pattern 3 in particular, we find that the use of a for [ə] may be appropriate for the nonmutated form as in [həus] 'house' (from Table 1), rendering it as haus. This, indeed, reflects the pronunciation in many dialects, as recorded most notably by Vogt (1979). However, the representation of the plural [həisr̥] as haisr would be inappropriate, suggesting to the reader that the word be pronounced as [haisr̥].

The most appropriate representation of the plural [həisr̥], reflecting actual pronunciation and fitting most neatly into the system would be as heisr, which also follows fairly well established tradition. Although the alternation of au and ei would correspond to practices in some dialects and would also be understandable to all dialects, it would not maintain the optimum symmetry of the system, in which, once again, the central vowel in a diphthong does not change and the back vowel changes to its symmetrically corresponding front vowel.

For the optimum correspondence between the symmetry of the umlaut patterns and the orthography, the singular should be represented as hous. This spelling is actually very satisfactory since it reflects the pronunciation in a widespread area that is particularly important in the de-

lineation of the Swabian language region, for it occupies the area adjacent to the Low Alemannic pronunciation of the word as [hu:s], and the boundary separating these two pronunciations is taken as the major boundary between Swabian and the rest of Common Alemannic. Moreover, this same region that pronounces the singular [hous] also pronounces the plural as [heisr] (on these points, compare Bohnenberger 1953). Of course, the spellings hous and heisr can be well accepted throughout the Swabian language, with other dialects approaching the initial element of the diphthongs with varying degrees of lowering or centralization. (Indeed, exactly the same practice is observed in American English with regard to the spelling ou in such words as house.)

Insofar as the relationship between patterns 3 and 5 is concerned, many dialects do not discriminate between the pronunciations of the diphthongs in the two singular forms -- to them, the diphthongs in [hæus] and [laof] are identical (see Table 1). To represent [laof] as louf, however, would not only create problems for the orthography in those regions that do discriminate, but it would violate the symmetry of the umlaut patterns. After all, to have some instances of ou umlauting to ei and others to ae would introduce a degree of irrationality to the system which, while it may indeed occur in some dialects, need not confuse the spelling system. Indeed, the alternation between the noun laof and the adjective laefeh maintains the symmetry of the umlaut system and the clarity of the spelling system.

Finally, let us return to the variations noted at the beginning of this paper between the different reflexes of MHG breit 'broad', which (as we can see now) involve the innovative umlaut pattern 6. In the geographically peripheral pronunciation of [braid], the [a] is a hold-out from the general shift from [a:] to [ǫ:], and speakers from these regions would probably have little difficulty in assigning the low central pronunciation to the diphthong with the low mid back vowel, especially since the diphthong ai does not exist in the new orthography (only ae is used). Of course, these regions do not maintain umlaut pattern 6, anyway (compare Baur 1967:70), and would probably not spell it. Literature from the more central regions, however, would certainly be clearer to them if the word breadr 'broader' (from Table 2) were derived from broad.

As for the second element of the diphthong, surely oa and oi would each be pronounced appropriately in dialects with the other pronunciation. Where broad would be pronounced [brǫid] the reader would simply overshoot the orthographic "target" of the diphthongal movement, and where broid would be pronounced [brǫəd] the reader would undershoot the "target." The choice between the two, then, may be made on greater systematic grounds, and once again the symmetry of the Swabian umlaut patterns would indicate a spelling of broad, in which the diphthong contains a central element that remains constant and a back vowel that changes to the symmetrically corresponding front vowel.

Thus, the orthography maintains the systematic symmetry of the Swabian umlaut patterns for all of the diphthongs. With the center line cutting through the central vowel region of the vowel triangle, all elements of these diphthongs that fall to the back of the center line umlaut to their corresponding position in the front, and all elements along the center line maintain their central positions.

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INTERFERENCE IN INTONATION: NOTES ON HUNGARIAN-AMERICANS*

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This paper presents three major characteristics of the Hungarian intonation of Hungarian-Americans, or Magygol intonation, in Adam Makkai's sense (1979:495). The data come from the audio taped interviews conducted for the Project on Hungarian-American Bilingualism in South Bend, Indiana.

1. Intonation systems in contact have been little studied in the literature on North American bilingualism. Rayfield (1970:72) states that "the retention of the intonation patterns of the native language constitutes one of the last features of a foreign accent in the speech of a bilingual who speaks the secondary language almost perfectly." A similar statement has recently been made by Penfield with regard to Chicano English (cf. Turner 1985). Rayfield (op. cit.) has shown that Yiddish intonation patterns are carried over into English speech and vice versa. Peñalosa (1980:106) cites Foster's observations on Chicano Spanish intonation, one of them being "declarative sentences with rising rather than falling intonation." Lehtinen (1966), Haugen (1969:419) and Seaman (1972:173) have hardly anything to say about

* We are indebted to Professors Robert Hetzron (University of California at Santa Barbara), Kenneth L. Pike (University of Texas at Arlington) and László Varga (Eötvös Loránd University, Budapest) for their critical remarks on an earlier version of this paper.

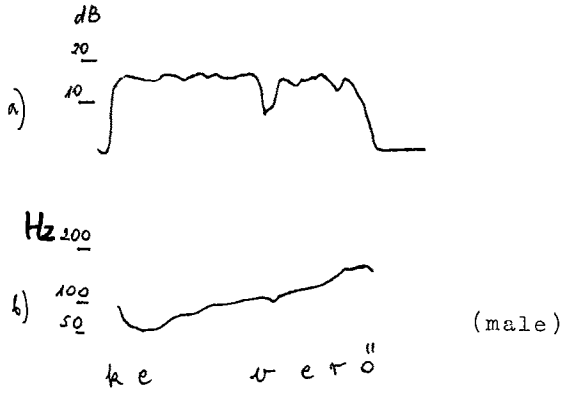
intonation. In his dissertation on Polish in America Lyra (1962:178) observes that, instead of a falling intonation, Polish-Americans quite often use phrase- or sentence-final rising-suspended intonation, "permissible in American English but disagreeable to Standard Polish." McRobbie's (1979:199) assertion that the intonation of her Hungarian-Canadian informants in Kipling, Saskatchewan differs very little from Standard Hungarian seems dubious to us in light of the 400-odd deviances from Standard Hungarian intonation in the South Bend corpus.

2. INFORMANTS AND DATA

The data come from 40 Hungarian interviews conducted for the Project on Hungarian-American Bilingualism in South Bend, Indiana in 1980 and 1981. Of the 40 informants 14 are old-timers (i.e. people who immigrated around World War I), 10 are freedom fighters (i.e. refugees of 1956) and 16 are American-born.* Deviances from Standard Hungarian (henceforth abbreviated SH) intonation have been found in 36 of the 40 American Hungarian (AH, for short) interviews: in the recordings of two old-timers and two freedom fighters no deviant intonation contours have been detected. The deviances have been established by Miklós Kontra: whenever he heard typically AH (i.e. non-SH) intonation in the recorded interviews, he entered the symbol <I> in the typed and computerized versions of the corpus.** In order to control for the subjectivity of the analysis, we have determined the fundamental frequency and the intensity of 100 deviant sentences with an FJ Electronics FFM 650 fundamental frequency meter and an IM 360 intensity meter. The instrumental analysis has substantiated the three characteristics of AH intonation that follow.

3. THE RISING QUESTION

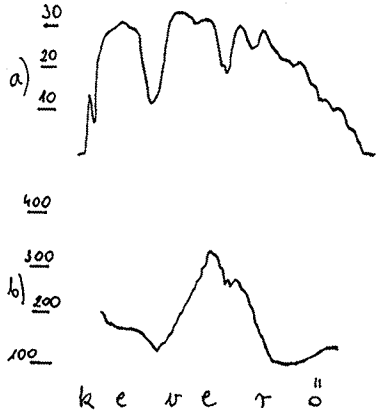
The most conspicuous deviance from SH is the rising intonation of yes-no questions that would have a rise-fall in SH. About half of all the deviances in the corpus belong to this category of English interference in AH intonation. This characteristic feature of AH intonation was first described by composer Zoltán Kodály (1937/1964: 296), who, incidentally, received his doctorate in Hungarian philology from the University of Budapest. An example of the rising question as shown by the intensity (a) and pitch meter records (b) is the following:



(male)

'[Is it a] mixer?' SB006B579***

The same question has the following record when spoken with SH intonation:



(female)

(The SH equivalents have been obtained by analyzing the relevant part in a larger stretch of the AH interview as spoken by a speaker of Standard Hungarian.)

The rising question in AH is obviously due to English interference. (In his Lado-type contrastive analysis Varga [1975:103-105 and 106-110] predicted that American learners of Hungarian may use a high-rise in questions.) Similar interference has been observed in the speech of Russians living abroad (Leed [1965], quoted by Bolinger 1978:502).

4. MISPLACED CHARACTER TONES

The term "character tone" as used by Varga (1983) is similar to the term "nuclear tone" as used by British analysts. The reason for using "character" rather than "nuclear" tones in describing Hungarian intonation is that a nuclear tone is initiated by the only primary-stressed syllable within an English tone group, whereas a character tone is initiated by the last one of potentially several primary-stressed syllables in a Hungarian tone group. English matter-of-fact statements are normally spoken with a mid-high-low intonation pattern, with the high occurring at the last stressed syllable (Lado 1978: 44). Ordinary statements in SH have a falling character tone (cf. Varga 1983). Fairly characteristic of AH intonation are the rise-fall character tones misplaced in statements due to English interference, e.g.

SB160A362

The same sentence as spoken in SH has a descending curve:

The AH intonation contour has been obviously induced by the English equivalent of the Hungarian sentence:

they showed it to the world

The fundamental frequency curves for *Megmutatták a világnak* show two things: (1) the character tone in AH is carried by a different syllable *(vi-)* from SH *(meg-)*, and (2) the AH character tone has a high-fall where SH would have a low-fall or level intonation. This example, as well as many others, proves Varga's predictions (1975: 98, 121, 122-123) correct: American learners of Hungarian (and mutatis mutandis Hungarian-Americans, we might add) may use a final high-fall "which Hungarian listeners will probably find too high" (ibid. 126).

Further examples (the words carrying the character tones are capitalized):

AH De pap nem vőt MAGYAR
'But [the] priest was not Hungarian'

SH De a pap NEM volt magyar SB128B567

AH Én nem tudok ANGOLU, engem ne röhögjenek KI
'I cannot speak English [but] nobody should ridicule me'

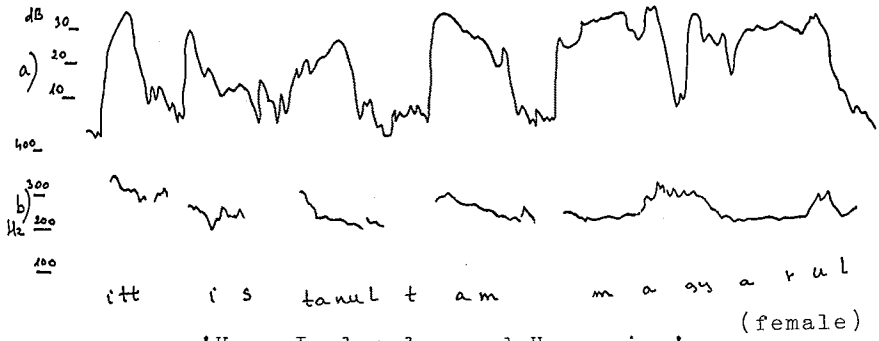
SH Én NEM tudok angolul, engem NE röhögjenek ki
SB034A077

(For a contrastive analysis of English nuclear tones and Hungarian character tones see Varga 1975.)

5. THE FALL-RISE

The fall-rise tone in English expresses 'assertion' + 'incompleteness' (Leech and Svartvik 1975:39). According to Bolinger (1978:510) many speakers of American English in giving a running account of something will use a terminal rise at the end of practically every sentence. Pike (1945:51) has described the 3-2 rising contour as usually implying "an INCOMPLETE SEQUENCE of phrases, events, or speakers." The 2-4-3 fall-rise "is very frequent in exposition," before a pause in the middle of a sentence (Pike 1945:55).

Approximately 10% of the deviant intonation contours in the South Bend corpus are fall-rises:

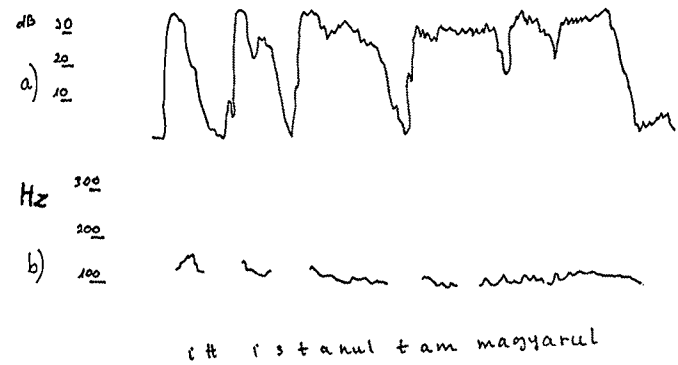


(female)

'Here I also learned Hungarian'

SB160A056

The SH equivalent of this sentence has a descending intonation:



(male)

Further examples (the fall-rise occurs on the capitalized words):

Azér mondom, én nem tudok ANGOLUL

'That's why I am saying I can't speak English'

SB144A188

Azért mert akárki valakivel még BESZÉLTEM

'Because whoever I spoke with'

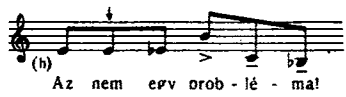
SB160A113

Some of these examples substantiate Varga's prediction (1975:121) that American learners of Hungarian may use a high fall-rise for the subclause if it implies something or states a condition.

The fall-rise in American Hungarian speech is clearly due to English interference.

6. A HYPOTHESIS

In the Hungarian literature a number of terms are used to describe a certain "sing-song, foreign intonation" which is said to be especially characteristic of certain speakers in Budapest. Boros (1971:460) gives this example:



'That is not a problem'

Imre (1963:283) terms this contour "blatantly conspicuous, sing-song, Budapest intonation" which is typical of the most authocthonous speakers in the Hungarian capital. Most characteristic of this terminological bushbeating in Hungarian linguistics is Wacha (1985:177), who quotes the late novelist Ernő Szép (1884-1953) as calling the said intonation *lipőtvárosi hanglejtés* 'Lipőtváros intonation'. *Lipőtváros* is the Jewish district of Budapest.**** (In his paper on the Yiddish rise-fall intonation contour Weinreich [1956:640-641] wrote that "the Jew stands out by his intonation in every country of the Old World as well as the New" and that "the Yiddish rise-fall intonation contour, which was unknown in the standard prestige languages with which the Jews were becoming increasingly familiar, came to be stigmatized as 'sing-song'.")

The misplaced character tones in AH described in 4. are practically equivalent to the Budapest Jewish intonation. Hungarian prescriptive grammars (e.g. *Nyelvművelő Kézikönyv* I:777) term this contour a mistake, something to be avoided due to its foreign origin. Labels like *éneklő* 'sing-song', *lipőtvárosi, idegenszerű* 'foreign' and the others are all pejorative and describe the attitudes of Hungarian non-Jews toward those who speak Hungarian with a Jewish intonation.

To our knowledge, no study has been carried out to investigate Hungarian speakers' attitudes to Jewish Hungarian intonation. (Some non-Jews also use the Jewish rise-fall.) The importance of attitudinal factors in interlingual communication has, however, been demonstrated by Coates (1975), among others. He has shown that "a Hungarian who asks an Englishman a favour using his native [interrogative rise-fall] intonation pattern is liable to meet with a frigid response."

With all this said, we hypothesize that the misplaced rise-fall of American Hungarians probably evokes the same negative attitudes in SH speakers as the Budapest Jewish intonation. This hypothesis can be (dis)proved by experiments using Lambert's matched guise technique. If our hypothesis proves correct, it means that Hungarian-Americans, the moment they open their mouths, may evoke negative attitudes in those speakers of Standard Hungarian on whose ears the Budapest Jewish intonation grates.

NOTES

* Aware of their less than perfect Hungarian, several American-born informants in South Bend call themselves *vadmagyarok* 'debased Hungarians'. For a brief sociological profile of the Hungarian community in South Bend, see Kontra and Nehler 1981a. The same authors have published the transcript of a sociolinguistic interview with a freedom fighter (1981b).

** The South Bend Hungarian corpus exists in typewritten form and on magnetic computer tape. In both versions deviances from SH are marked for phonology (e.g. vowel harmony, word- and sentence-stress), grammar (e.g. word order, case endings), vocabulary (e.g. loanwords and loanshifts) and pragmatics (e.g. cases of misunderstanding between informants and the interviewer, a speaker of SH). Thus it is a trivial matter to have the computer search for and print in context and with loci all cases of, say, deviant intonation in the corpus. The entire corpus is over 2,000,000 characters in length.

*** This locus (and the others, respectively) is to be read as follows: the example is found on cassette SB006 in the South Bend archive, on side B, at 579 on the counter of a Sanyo M2502U cassette tape recorder.

**** After the Hungarian Holocaust, in post-World War II Hungary, calling Jews *zsidó* 'Jew(ish)' in public has practically become a sign of anti-semitism. The bush-beating in Hungarian linguistic terminology is obviously due to the word being a taboo. In private conversations, however, one invariably hears *X zsidósan beszél* 'X speaks in a Jewish way'. *Budapesti hanglejtés* 'Budapest intonation' is the printed and unspoken euphemism for Jewish intonation.

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NUCLEUS ASSIGNMENT IN FRENCH AND IN CATALAN

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0. Introduction.

One of the major issues in syllabic phonology concerns the nature of syllabicity, and the degree to which it is an inherent property of segments. Classical generative phonology assumed that syllabicity was best represented as a feature, even though its phonetic correlates were not easily defined.

Non-linear phonology presents us with the option of representing syllabicity as a supra-segmental property, since it is often derivable from information provided by syllable-structure. There is considerable variation, however, in the ways that syllabicity and syllable structure are thought to interact. In some models, the metrical skeleton of a word is composed of C's and V's and all information regarding syllabicity is encoded at that level; in others, syllabicity is purely a function of configurational properties of the syllable.

The fact that syllabic properties of segments are derived from information provided by syllable structure (e.g. their position in the syllable) while syllable structure itself is in great part derived from phonetic properties of segments (either through a template or through a set of syllable-building rules) has led to a certain amount of confusion and may have been partly responsible for the emergence of systems where syllabicity is encoded redundantly at several levels (syllabic, skeletal and segmental).

The metrical framework developed in Levin (1985) corresponds in part to an effort to eliminate such redundancy. The two characteristics of this framework that will retain our attention here are the following:

1) syllable structure is mostly derived by rule; rarely is it determined lexically.

2) syllabicity is never represented at the skeletal level or at the segmental level. There are no C's and V's, but only skeletal slots, and feature matrices do not contain either [syll] or [voc]. Rather,

encoding is done at the constituent level, in the sense that a syllabic segment is one that is linked, by rule or lexically, to a nucleus node, a property we will refer to as nuclearity .

In its attempt to establish this property as 'the sole determinant of syllabicity', this framework provides the phonologist with a definite challenge, since lexical information is restricted and the phonological component extended to include rules and principles which assign or predict nuclearity. The general question that emerges is this: How much information about syllabicity is lexical and how much is rule-governed? In languages without underlying syllabic consonants, like all Romance languages, this question narrows into a more specific one: If [syll] is not available and the skeleton is composed exclusively of slots, then what is the phonological representation of glides?

This paper examines N-Assignment (and, consequently, the status of glides) in two Romance languages[1]: French, a language with predominantly open diphthongs, and Catalan, a language with predominantly closed diphthongs. But we must first recognize the presence of a pan-Romance rule which automatically assigns a nucleus node to all non-high vowels. Non-high glides in Romance are not underlying, and their presence defines a marked situation with respect to the redundancy rule formulated in (1):

(1) Non-high Vowel N-Assignment (Romance)

```
[-cons]     [-cons]
[-high]     [-high]
   |           |
   x    -->    x
               |
               N
```

(Assign N to low and mid vowels)

1. Nuclearity in French

In recognition of the fact that Modern French exhibits primarily sequences of GV, we posit the following rule:[2]

(2) High-Vowel N-Assignment (French)

```
[+high]          [+high]
[-cons]          [-cons]
   |                |
   x      -->       x
                    |
                    N
```

Condition: x does not precede x]

(Assign N to high vowels which do not precede a syllabified slot)

A later rule (Branching-N) links to N all [+high,-cons] material that immediately precedes N, thus creating complex nuclei (falling diphthongs):[3]

(3) Branching-N (French)

```
[+high]                    [+high]
[+cons]                    [+cons]
   |                          |
   x'     x   --->            x     x
          |                   \    |
          N                        N
```

This process is in its turn followed by the expected rules of the syllable-building process. These rules handle [+cons] material and construct onsets, then codas according to (mostly language-specific) parameters and sonority constraints. These processes will not retain our attention here.[4]

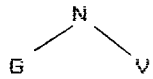
Three factors come to create apparent exceptions to rule (2):

1) Phonological contrast . There seems to be ample motivation for assuming that Modern French distinguishes phonologically between two types of segments, one being specified as [+cons, +high], the other as [-cons,+high], which are however merged phonetically later in the derivation. Evidence for this comes essentially from two quarters:

- a minimal contrast between high segments which precede a vowel. Compare the two different structures which dominate GV sequences, as shown in (4) and (5):

```
(4)     O       N              [wat]   'watt'
        |       |              [pije]  'piller'
        G       V              [peja]  'paya'
```

(5)

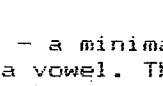


[wazo] 'oiseau'
[pje] 'pied'

In (4), [w] and [j] are specified as [+cons] and function as onsets while in (5), they are specified as [-cons] and reattach to N to form a complex nucleus.

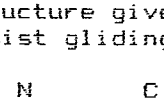
- a minimal contrast between segments which follow a vowel. Thus, some VG sequences correspond to the structure given in (6), while the VV sequences in (7) resist gliding:

(6)



[pEj] 'paye'

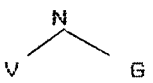
(7)



[pei] 'pays'

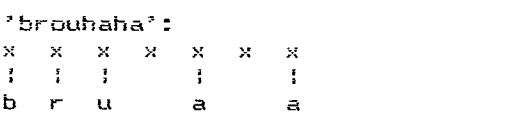
In (6), [j] is specified as [+cons] and functions as a coda, while in (7), it is specified as [-cons] and gets assigned N. Compare this approach with the one advocated in Kaye and Lowenstamm (1984), where similar structures are posited lexically (not rule-generated). Note in particular that the absence of some structures, like the complex nucleus in (8), seem totally arbitrary from a lexical point of view. In this framework, however, they follow directly from the rules of the grammar. Structure (8) cannot exist in French since N-Assignment applies before any kind of reattachment rule.

(8) *



2) <u>Metrical abstractness</u> . A number of words exhibit a form of hiatus (most often, but not always, represented in the orthography by a letter <u>h</u> or a diaeresis accent mark) which seems best analyzed by positing empty slots. Thus, such forms as "brouhaha" and "hier" will be represented as in (9), and 'aï' and 'chahut' as in (10):

(9)

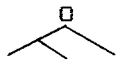


```
(10)    'aï'                          'chahut'
        x   x   x                       x   x   x   x
        |       |                       |   |       |
        a       i                       š   a       y
```

These slots interfere with adjacency and prevent the high vowels in 'brouhaha' and 'hier' from forming a complex nucleus and those in 'aï' and 'chahut' from forming a coda.[5]

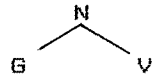
3) Configurational constraint . The constraint given in (11) specifies that Modern French does not accept configurations where the onset is double-branching (Kaye and Lowenstamm 1984).

(11) *



This constraint is at the source of another contrast between two sets of words where a sequence of two high segments is preceded by two consonants. In (12), the sequence forms a complex nucleus, while in (13), N-Branching has apparently failed to apply:

(12)



[trwa] 'trois'
[brui] 'bruit'

```
(13)    N       N       [tru.a]  'troua'
        |       |
        V       V
```

This merely derives from the morphological composition of the word and the fact that N is assigned before words are formed. Initially, rule (2) hits two morphemes at Level 1 (i.e. before Inflection) in 'tru + a'. In single-onset words like 'rouer', resyllabification creates a monosyllabic form .In double onset forms like 'trouer', such resyllabification cannot apply since it would create a double-branching onset of the kind prohibited in (11).[6]

Have we, then, done away with all exceptions to assignment rules and can we maintain that syllabicity marking is absent from the grammar of French. Not quite. It would, after all, be somewhat surprising to assume that no lexical marking is ever required and that there is something about assignment rules that makes them absolutely exceptionless, and thus radically different from stress rules (or just about any other phonological rule we know of).

There are some words for which it seems

reasonable to posit lexical N's. In the items given in (14), which are very similar to 'troua' since they underwent identical morphological processes, all sense of a morpheme boundary has been lost. Accordingly, it may be preferable to assume that their original morphological composition has faded away and phonologized into a diacritic-like lexical N mark.

(14) [try.El] 'truelle'
[fly.id] 'fluide'

2. Nuclearity in Catalan .

In recognition of the fact that Modern Catalan exhibits primarily sequences of VG, we posit the following rule:

(15) High Vowel N-Assignment (Catalan)

```
[-cons]          [-cons]
[+high]          [+high]
   |                |
   x     -->        x
                    |
                    N
```

Condition: x does not follow x]

(Assign N to high vowels which do not follow a syllabified segment).

A later rule, Branching-N, links to N all [+high, -cons] material that immediately follows N, thus creating complex nuclei (rising diphthongs).

(16) Branching-N (Catalan)

```
        [+high]                    [+high]
        [-cons]                    [-cons]
           |                          |
   x       x'       --->      x       x
   |                          |
   N                          N
```

The factors that create apparent exceptions to rule (15) are similar to the ones discussed for French.

1) Contour segments . Catalan differs from Spanish in that, as predicted by (15), high vowels do not glide before vowels. Thus, compare Cat. 'duana', trisyllabic [du.a.nə], with Sp. 'aduana' [a.dwa.na].

There is only one type of words where this fails to occur, namely when the historical source of the [w] is a labiovelar. Thus, we have [gwan] for 'guant' or [kwota] for 'quota'. This occurs only with [w], never [j], and, predictably, there is only one type of phonetic triphthongs, namely [wVG], which only occurs after [k/g]. We analyze this [w] as endowed with the feature [+cons]. Thus, compare, in (17) and (18), the structures attributed to 'quota' and 'cuota':[7]

```
(17)          [+cons]
      [kF]   [ uF  ] [oF] [tF] [aF]          'quota'
       |       |       |    |    |           [kwo.tə]
       x       x       x    x    x

or, as a contour segment: k u o t a
                           \/ | | |
                            x x x x

(18)          [-cons]                        'cuota'
      [kF]   [ uF  ] [oF] [tF] [aF]          [ku.o.tə]
       |       |       |    |    |
       x       x       x    x    x
```

2) Metrical abstractness . Empty slots also prevail in Catalan. In a number of words, a high vowel does get assigned a nucleus even though it doesn't follow a consonant. These are words of the type: 'vei' [bə.i]. Again, the underlying structure seems to correspond to:

```
(19)
        x    x    x    x        'vei'     [bə.i]
        |    |         |        'ahir'    [ə.ir]
        v    e         i        'paisos'  [pə.i.zus]
```

3) Morphological composition . Finally, some words like

```
(20)  'coincidir' [ku.in.si.di]
      'fruint'    [fru.in]
      'cuina'     [ku.i.nə]
```

do not form a diphthong and their behavior is essentially similar to that of Fr. 'roua', 'troua'. The same morphological explanation applies. Catalan has no configurational constraint, but neither does it have a gliding rule (except post-lexically). As a result, the high vowels in (20) remain distinct.

As was the case for French, we are drawn to the conclusion that there may be very little need for underlying marking of syllabicity in Catalan.

3. Conclusion .

In manner of conclusion, it should be pointed out that languages which have a mixed set of underlying diphthongs obviously do not present such a simple picture of nuclearity. In the case of Spanish, with its rising and falling diphthongs, not only do some assignment rules have to have directionality built-in, but a higher degree of lexical N-marking is required. Still, the approach adopted here represents a major improvement over one which posits an inordinate amount of underlying syllable-structure since nuclearity is now rule-generated, at no extra cost to the grammar. Spanish demonstrates that it is also quite an improvement over an approach which still relies on stress to predict the glides vs. vowels alternations. Here, the roles are reversed: if nuclearity is defined the way that we suggested it should be, then stress can be based on the syllabic value of the segment, which, in its turn, is predicted by rules of N-assignment and of reattachment. The correlation between stress and the deviant character of segments lexically dominated by N is expressed by the following principle:

(21) All segments which are lexically marked for nuclearity attract stress.

Footnotes

1. To our knowledge, the only major study which applies this metrical framework to a Romance language is the very thorough examination of Surmiran to be found in Kamprath 1986.

2. We follow Levin's notation (1985:62) in using the symbols x' for an unsyllabified segment and x] for a syllabified segment.

3. Ordering Branching-N before (2) would obviously simplify (2) by getting rid of the condition tagged on to it. We reject this approach, however, since French does have diphthongs which involve sequences ot two high segments (as in yi,wi..). Furthermore, it may be the case that, in Romance, all instances of N-Assignment precede instances of reattachment to N.

4. Montreuil (in progress) presents a complete picture of adjunction and incorporation processes for Standard (and some dialectal) French.

5. It might even be the case that, for some speakers, the underlying representation of "pays" (sometimes realized as [peji] also contains an empty segment.

6. This 'resyllabification-through-gliding' rule can itself be blocked. Witness forms like 'chat-huant' [y.ɑ̃] or 'boules puantes' [py.ɑ̃t]

7. Admittedly, there exists the alternative of representing the entire k/g+w complex as a contour segment (dominated by only one x). But, even if this is the case, the crucial point of this analysis remains, namely that this [w] is never [-cons].

8. This is exemplified by words like 'día' or 'baúl'. The motivation for this comes from the fact that Spanish never displays a syllable head consisting of a high segment in a position of adjacency to another head, unless that high segment is stressed. In other words, next to N, [+hi] is either a glide or a stressed vowel, never (as is the case for French or Catalan) an unstressed full vowel.

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SOME ABSTRACT FEATURES OF KWA VOWEL HARMONY: AN AUTOSEGMENTAL APPROACH TO ENGENNI, IGBO, AKAN, AND YORUBA

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0. INTRODUCTION

The primary purpose of this paper is to examine tongue root vowel harmony in Kwa languages. The focus of the analysis will be on the Engenni language. Additionally, a brief comparison will be made with the vowel harmony systems of Igbo, Akan, and Yoruba. Using autosegmental phonology as a theoretical framework, the paper will point out the underlying system of tongue root harmony common to all four languages, and will in the process, suggest a solution to the anomalous harmony system in Yoruba.

1. A BRIEF SKETCH OF ENGENNI HARMONY

Engenni[1] has one of the most straightforward vowel harmony systems in the Kwa language family.

The vowel inventory of Engenni as reported in Thomas (1978) is as follows:

(1)

		Front	Central	Back
Close	Raised	i		u
	Lowered	I		ʊ
Nonclose	Raised	e	ə	o
	Lowered	ɛ	a	ɔ

The 'raised' vowels in the chart are described as "those with the tongue more raised, resulting in a closer quality," while the lowered set are described as having "the tongue more lowered and slightly further back, resulting in a more open quality" (Thomas 1978:11).

It is readily apparent from the above description that Thomas is referring to the same quality of the vowels that Ladefoged (1964) described as 'tongue root position,' i.e.,:

> "[+ATR] (advanced tongue root) vowels are produced with an advancing of the tongue root which causes an increase in the width of the pharynx whereas [-ATR] vowels are produced

without any advancing of the tongue root" (Ringen 1979: 248).

It is reasonable to reinterpret the vowel chart into a feature matrix as follows:

(2)

		-back		+back
			-rnd	+rnd
+high	+ATR	i		u
	-ATR	I		ʊ
-high	+ATR	e	ə	o
	-ATR	ɛ	a	ɔ

This division of the vowels into two groups, the [+ATR] and the [-ATR] vowels is the structure upon which vowel harmony in Engenni is built. All the vowels in a phonological word are either from the raised tongue set, [+ATR], or the the lowered tongue set, [-ATR]. In fact, in the phonemic analysis of Engenni, Thomas proposes only five vowels. The feature of tongue position (raised or lowered) is analyzed as a feature of the phonological word.

Orthographically, the vowel phonemes are represented as /i/, /e/, /a/, /o/, and /u/. The [-ATR] feature is represented as a dot under the first vowel of a word.[2] [+ATR] is unmarked. An exception to this convention is when the only vowel in a word is [a]. Words with only [a] are not marked since words with only the vowel [ə] are very rare.

The domain of vowel harmony in Engenni, as we have seen, is the phonological word.

"The phonological word is... characterised by vowel harmony. It usually correlates with the grammatical word, except in the case of compound nouns. Various groupings within the nominal phrase, a singular pronoun subject and the following verb, and the verb and following postverbal(s) constitute extended phonological words. Vowel harmony operates throughout the extended phonological word..." (Thomas 1978: 17).

Three different types of particles harmonize with the preceding word: demonstratives, singular pronouns (which happen to be monosyllabic), and the numeral 'one'.[3]

(3) Demonstratives

ɔdɔ anɔ	'this rope'	odo ənɔ	'this mortar'
ɔdɔ ayɔ	'another rope'	odo əyo	'another mortar'

(4) Sing Pronouns

ɔdɔ mɛ	'my rope'	odo me	'my mortar'
ɔdɔ I	'their rope'	odo i	'their mortar'
əwo faI wɔ	'your new shirt'	əwo dho wo	'your old shirt'

(5) Numeral 'one'

ɔdɔ avʊ	'one rope'	odo əvu	'one mortar'
ɛdhya gbɛrI avʊ	'one small yam'	ɛdhya bo əvu	'one big yam'

A monosyllabic pronoun NP, either as subject, or the 3rd person singular pronoun as object harmonizes with the nearest element of the VP.

(6) NP = Subject

mi me	'I agree'
mI mɔnI me	'I cannot agree'
bhu yi	'You came'
bhʊ dhI	'You ate'
o dire eseni	'She cooked a fish'
ɔ dʊ akanI	'She bought cloth'
i gbe	'They go home'
I bIdha	'They walk'

(7) NP = Object

o dose i	'He begged him'
ɔ tɔʊ kyɛ I	'He gave it to him'

There is also a class of postverbal particles which function as attributive elements of the VP and harmonize with the vowel quality of the preceding verb. They are:

(8) Postverbals

dhe (padhɛ)	'finished, completely, thoroughly'
me	' 1st person singular object'
wo	' 2nd person singular object'

Me and *wo* may precede or follow *dhe*, but they only follow *padhɛ*. They are considered elements of the VP and not as pronouns or adverbs by Thomas for two reasons. First, they may be followed by an aspectual particle, *ni*. This particle precedes pronouns and adverbs. Second, postverbals may bear morphological tone that carries verbal information. Tone on the other monosyllabic object pronouns remains constant.

(9) o kpei dhe me 'He finished washing me'
ɔ kpɛ dhɛ mɛ 'He finished paying me'

2. AUTOSEGMENTAL THEORY AND VOWEL HARMONY

The harmony system will be reanalyzed using autosegmental phonology as a theoretical framework. Autosegmental phonology was developed to handle phonological problems that were difficult to resolve in a standard segmental treatment.

Much of the early work in autosegmental phonology dealt with tone problems such as contour tones on single segments,[4] floating tones, and bidirectional spreading of features (Goldsmith 1976). Vowel harmony is one case of feature spread.

The salient notion of autosegmental phonology is that there is a segmental tier in phonology and there are additional tiers containing autosegments that do not seem to map into the segments in the same way that traditional distinctive features do. These autosegments may be tones, nasality, or other features that may be spread across several segments or multiply specified in a single segement. For example, in a hypothetical language with a grammatical tone pattern, H L, marking future on the verb we could see the following patterns:

```
(10)      H L                 H L              H L
          \/                  | |              | |\
          ba   'to  come'     aba   'to go'    abaka 'to stay'
          ^                  /\                /\\
==>       ba                 aba               abaka
```

In addition to the separate tiers and the spreading features, an autosegmental model has a set of well-formedness conditions (WFC's) consisting of universal and language-specific conventions that dictate how the tiers may be linked, and defining permissible forms.

In a vowel harmony system, then, we need to specify the harmonizing feature(s), the harmony-bearing segments (i.e., which segments the harmonizing feature will link with), and the direction of association (right to left, left to right, or bidirectional).

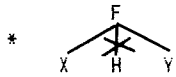
For some languages, we need to look at the role of neutral vowels and opaque vowels as well. The view of vowel harmony we will adopt is that of Kiparsky (n.d.).

Neutral segments are those which do not receive the harmonizing feature, and do not affect the spread of the feature to other segments. A well-formedness condition prohibiting the association of neutral segments to the harmony feature specifies:

```
(11)      F
       *  |
          N
```

Harmonic segments are those which must be associated if they are in a harmonic domain. A well-formedness condition prevents them from being skipped in the association of the harmony feature.

(12)



Kiparsky defines opaque segments as being both harmonic and neutral. As neutral segments they must not be associated (11), and as harmonic they may not be skipped if they are contained in a harmonic domain (12). It follows that these segments cannot be contained in a harmonic domain at all (Kiparsky n.d.:14). Since opaque vowels cannot be skipped and cannot be associated, they block the spread of harmony. So three segment types for harmony systems can be distinguished by the two WFC's.

(13)

	non-neutral (harmonic)	opaque	non-harmonic (neutral)
WFC (11)	-	+	+
WFC (12)	+	+	-

3. ENGENNI HARMONY

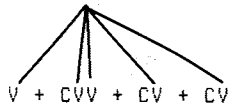
Having thus laid the groundwork there are several observations that may be made about vowel harmony in Engenni:

(14)
1. Vowels are the harmonic segments in Engenni.
2. There are no neutral or opaque vowels.
3. ATR is the harmonizing feature.
4. ATR is associated with the root vowels.
5. The domain for vowel harmony is the phonological word.
6. Spread is bidirectional.

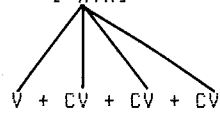
So, for Engenni all roots are specified in the lexicon as [+/-ATR]. Underlyingly the vowels are unspecified for this feature. They receive this feature by spreading as soon as inflectional and derivational processes have been applied, but before compounding. A derivation could look like the following:

(15) a.

b. [+ATR]

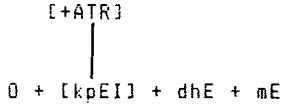


b. [-ATR]

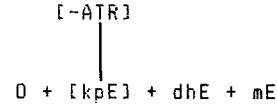


Substituting data we can see this at work. In the example below, capital vowels O, E, and I represent vowels that are unspecified for ATR.

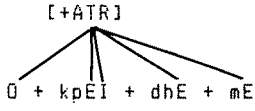
(16) a. [+ATR]



a. [-ATR]



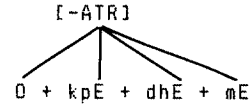
b. [+ATR]



c. ==>

o kpei dhe me
He finished washing me.

b. [-ATR]



c. ==>

ɔ kpɛ dhɛ mɛ
He finished paying me.

4. IGBO HARMONY

Igbo is another of the Kwa languages spoken in Nigeria. The vowel harmony system of Igbo[5] shares much with that of Engenni. Igbo has two sets of vowels operating in its harmony system. There are no neutral or opaque vowels.

(17)

	[+ATR]			[-ATR]	
	-rnd	+rnd		-rnd	+rnd
+high	i	u	+high	I	ʊ
-high	e	o	-high	a	ɔ

Though Igbo has simplified its vowel system (by doing away with the [+/-back] distinction), it has essentially the same underlying vowel harmony system as Engenni.

Looking to the data in (18), we see that the phonological word is the domain of spread; the spread is bidirectional,

incorporating both prefixes and suffixes; [+/-ATR] is the harmonizing feature, and the harmonizing feature attaches to the root.

(18)	a + zʊ + la	'don't buy'		
	a + ta + la	'don't eat'		
	e + ke + le	'don't share'		
	I + lʊ	'to marry'	ɔ + lʊ	'marrier'
	I + ta	'to eat'	ɔ + ta	'eater'
	i + vu	'to carry'	o + vu	'carrier'
	anʊ	'animal'	osisi	'tree'
	ulɔ	'house'	oke	'rat'
	akwʊkɔ	'leaf, paper'		

5. AKAN HARMONY

While Akan, another Kwa language from Ghana, has the same underlying harmony system as Engenni and Igbo, there are two important differences in its harmony system.[6]

First, Akan has developed a set of opaque vowels. Second, it has developed a [+/-low] distinction in its vowel system. Recall that the feature [low] was not necessary in classifying the Engenni vowel system. The [+/-low] distinction is necessary for classifying the vowels since it is the [+low] vowels that are opaque. That is, they block the spread of harmony in roots.

(19)

	[+ATR]			[-ATR]	
	-back	+back		-back	+back
+high	i	u	+high	I	ʊ
-high -low	e	o	-high -low	ɛ	ɔ
+low		ə	+low		a

When there are no low vowels in a word, all the vowels must be either [+ATR] or [-ATR], (20a) and (20b). The low vowels occur with either set, (20c) and (20d).

(20)	a.	ebuo	'nest'
	b.	ɛbʊɔ	'stone'
	c.	bisa	'to ask'
	d.	pIra	'to sweep'

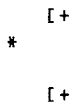
In cases of roots containing low vowels, prefixes and suffixes harmonize with the first or last root vowels.

(21)	a.	ɔ + kasa + I ==> ɔkasaI	'he spoke'
	b.	ɔ + fiti + I ==> ofitii	'he pierced it'
	c.	ɔ + bisa + I ==> obisaI	'he asked'

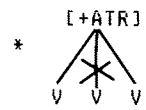
d.	ɔ + kəri + I	==> ɔkərii	'he weighed it'
e.	a + kasa	==> akasa	'has spoken'
f.	a + fiti	==> əfiti	'has pierced it'
g.	a + bisa	==> əbisa	'has asked'
h.	a + kəri	==> akəri	'has weighed it'

The low vowels, then, do not receive the harmony feature (11), and since they may not be skipped in the harmonic domain (12), the domain ends with the [+low] vowel. So for the Akan system we have the following instantiations of the two WFC's:

(22)



(23)



So the Akan vowel harmony system has the following features in common with Engenni and Igbo: the phonological word is the domain of spread; the spread is bidirectional, incorporating both prefixes and suffixes; [+/-ATR] is the harmonizing feature, and the harmonizing feature attaches to the root.

The primary difference between Akan and Engenni and Igbo is the addition of the opaque vowels which may block spread in the word.

6. YORUBA HARMONY

At first glance, the Standard Yoruba (SY)[7] vowel harmony system does not seem to operate on the same principles as the other Kwa languages we have examined.

The traditional view of Yoruba vowel harmony following Ladefoged (1964) uses two sets of five vowels to describe the harmony system.

(24) Set 1

i	u
e	o
a	

(25) Set 2

i	u
ɛ	ɔ
a	

Two problems are immediately apparent. First, both sets have [+ATR] high vowels. Second, [a] occurs in both sets. The system seems to be very different, but in fact, there are only minor differences between Yoruba vowel harmony and that which we found in the other languages.

In Akan we saw that the low vowels had become opaque. From the data available in the articles cited, it was not possible to

determine in Yoruba whether the low vowels are opaque or neutral (due to the fact that there are no forms cited with [a] occurring in the middle of a form that have [ɛ] or [ɔ] on one side and [e] or [o] on the other). It is clear, though, that [a] is either neutral or opaque. Given opaque low vowels in Akan, this is not a surprising development.

Although there are not enough data to determine that high vowels are definitely neutral instead of opaque, they appear to be neutral. In (26) we can see that when the mid vowels are separated by high vowels they harmonize. (More data would probably bear out the assumption that they are neutral).

(26) i o ti de 'he said that he (someone else) had come'
i ɔ ti lɔ 'he said that he (someone else) had gone'
o di were 'he became a mad man'
o tu ti jo 'it has got burnt again'
ɔ tu ti bɛ 'it has burst again'

Once again we can see that there is a common vowel harmony system at work among the Kwa languages. The essential difference between the Engenni system and the Yoruba system is that SY has acquired neutral features for the high vowels, and either neutral or opaque features for the low vowel. In other respects the most anomalous system, SY, and the most regular system, Engenni, are alike.

An interesting question remains. Why should the high vowels be neutral in SY when none of the other languages examined had high vowels operating in such a manner? First, note that there is no [+/-ATR] distinction for SY high vowels, and that the high vowels operate in both sets of harmony.

The answer to the problem seems to come from historical phonology. Two Yoruba dialects, Ijeṣa and Ekiti, have the following sets of harmonizing vowels:

(27) Set 1

i	u
e	o
a	

(28) Set 2

I	ʊ
ɛ	ɔ
a	

Comparing these systems with SY, we can see that they too have [a] in both sets, but we can also see that Ijesa and Ekiti have retained the [+/-ATR] distinction for the high vowels. A comparison of the following items, while not conclusive, indicates that SY may have previously had both sets of high vowels, but lost them in a historical merger.

(29)

Ijẹṣa & Ekiti	SY	
oju	oju	'eye'
obi	obi	'kola nut'
Iyɔ	iyɔ	'salt'
ʊkɔ	ikɔ	'cough'
ʊsɛ	isɛ	'work'
Ijɛ	ɛjɛ	'blood'
Ila	ila	'okra'
ʊgba	igba	'calabash'

The harmony systems of Ijesa and Ekiti, then, appear to have the same underlying harmony system as the other Kwa languages examined in this paper, and SY does as well.

7. CONCLUSION

From our comparisons some observations may be made about the vowel harmony systems of Kwa languages.

(30)
1. ATR is a common harmony feature in Kwa languages.
2. Harmony is a feature of the root in Kwa lexicons.
3. The domain of harmony is the phonological word in Kwa languages.
4. Feature spreading is bidirectional in Kwa languages.
5. Some Kwa languages have developed opaque (and perhaps neutral) vowels by a redefinition of the distinctive features on the vowels.

Comparisons of other vowel harmony systems should now be attempted to determine how widely the observations in (30) (especially 1-4) hold among the other Kwa languages. If the greater number of other Kwa languages have the same underlying harmony system, then comparative reconstruction should also be done in the languages to determine whether or not the rule in question is a feature genetically inherent in Kwa languages or whether it is an areal feature shared by more than one family of languages. Thus the classification of languages that are in question, such as the Kru group, may be accelerated by examining the bases of their vowel harmony systems.

NOTES

[1] Engenni is a language spoken by about 10,000 people living in the Ahoda division of the Rivers State of Nigeria. Engenni is a member of the Edo branch of the Kwa language family (Thomas 1978).

[2] In this paper, however, vowels will be represented phonetically.

[3] The data and their arrangement are largely from Thomas (1978).

[4] The idea here is that it doesn't make sense to have a single segment subspecified as [(+Highpitch, -Lowpitch) (-Highpitch +Lowpitch)] as a contour tone on a vowel implies.

[5] The data for this section are from the Ọhụhụ dialect of Igbo. It is taken from Ringen (1979).

[6] The data presented here are from the Akuapem dialect of Akan and appear in Stewart (1983).

[7] Yoruba is a Kwa language spoken in Nigeria, Benin, and Togo. (There are other large emigrant groups of Yoruba speakers elsewhere. For example, about 1/3 of the population of Freetown, Sierra Leone is Yoruba). The material in this section is from Bamgbose (1967), Awobuluyi (1967), and Awobuluyi and Bamgbose (1967).

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THE AFAKA SCRIPT: AN INDIGENOUS CREOLE SYLLABARY

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The Ndjuka[1] language of Suriname is unique in being the only known creole language with a writing system developed by a native speaker of the language. This system, known as the Afaka script after its originator, is, like many other vernacular writing systems (cf. Vai, Cherokee), a syllabary. Its history and use have been well documented in several articles by C. N. Dubelaar and J. W. Gonggryp (see References). I will therefore treat these topics only briefly here, and then turn to a comparison of the syllabary with the phonological system of Nd and a discussion of the problems arising from the underrepresentation of phonological contrasts by the syllabary.

At the time of the appearance of Halley's comet in 1910, a Ndjuka reported having a series of visions or dreams in which God gave him the assignment to bring his people into literacy. Afaka regarded the appearance of Halley's comet at this time as a divine sign confirming the assignment, one which he had not immediately obeyed on the occasion of his first dream in 1908.[2] On awaking from one of these dreams he began developing a set of 56 syllabic signs, adding another every two or three days. He gathered around him others who shared his vision of the benefits of literacy and of education for the Ndjukas, the **bukuman**, or 'book people,' who learned his script. By 1920 more than 100 men, women, and children were reported using the script (Dubelaar 1976:29). But the script was not approved by the paramount chief of the tribe, and it never gained wide currency. It is still used today by at most a handful of Ndjukas, among other things for medicinal recipes.

Where Afaka got his symbols is an interesting question, dealt with by Ratelband 1944 (who claimed influence on Afaka from the Vai script), and Dalby 1968 and Dubelaar 1976 (who both found the resemblance between the Afaka script and the Vai script to be at the level of chance). More of interest to us in this paper is the relation between phonological contrasts represented in the script and those operating in the spoken language. For this a summary of some features of Nd phonology is in order.

The Nd phonological units are set out below (following Huttar and Huttar 1972):

p	t	k		i	u
b	d	g		e	o
f	s		(h)		a
(v)	(z)			Nasalization contrast for all vowels.	
m	n				
l				Each vowel bears either high or low tone.	
w	y				

Syllables end in an oral or nasalized vowel, never in a consonant. Syllables begin with a vowel, with any of the consonants, or with certain sequences of C + /w/ or /y/. It should be pointed out that the palatal nasal [ñ] is here treated as a sequence /ny/, even though we have no strong evidence that native speakers perceive it that way rather than as a unit. Likewise for /kw ty dy/, all of which, like /ny/, have their own representation in Afaka's system, as well as other "sequences" not specially represented in the script. Phonetic double stops [^{k}p ^{g}b] vary with [k^{w} g^{w}], and are here taken as realizations of the sequences /kw gw/, respectively.

Vowels occur as short or long, and in the latter case are taken as a sequence of two like vowels, each bearing contrastive tone. Diphthongs are /ai ei oi au ou/; in triphthongs, the first two elements always have the same quality, though again not necessarily the same tone: /aai, eei, ooi, aau, oou/. While it is convenient for purposes of predicting stress to treat sequences of vowels as belonging to the same syllable (see Huttar and Huttar 1972), such sequences can equally be considered as belonging to two or three syllables. In the latter interpretation, the second and third vowels each then constitute an entire V syllable. Nasalization acts as a prosody across all the vowels of a diphthong or triphthong: the whole sequence is either nasalized or not.

In addition to the syllable shapes just described, Nd also has syllabic nasals, all of which occur word initially without contrastive tone, and assimilated in point of articulation to the following consonant: **mboma** 'python,' **nzáú** 'elephant.' These have no special representation in the syllabary; how words containing them are represented in the script should give evidence for their underlying form, but none of the texts I have seen include any such words, except for the proper name **ndyukã** itself, which is always written without the nasal, dyU + ka, which is the corresponding form in Sranan, the creole very similar to Ndjuka which serves as Suriname's lingua franca.

Nasalized vowels are alternately realized phonetically as nasalized vowel, nasalized vowel plus nasal consonant, or oral vowel plus nasal consonant. Thus a syllable may end phonetically in a consonant, but still, as mentioned above, does not end in an underlying consonant (although final consonant symbols are used here and in the practical orthography, where nasalized vowels are symbolized by Vn). Before a vowel, nasalized vowels are denasalized:

1. **a san ati ---> a saati** ´The sun is hot.´

While all vowels except those in most monosyllabic function morphemes bear contrastive tone, cases of morphemes differing only by tone are rare. Thus it is seldom necessary to mark tone; an important exception is the contrast between na ´be´ and ná ´not be´:

2. **ná wani mi wani, na musu mi musu**
is-not want I want, is must I must

´It´s not that I want to, but that I have to.´

Like many creole languages, Nd is marked by a high degree of multifunctionality: one form may serve as transitive verb, intransitive or stative verb, adjective, and noun, for example (cf. Voorhoeve 1980), and definite articles have the same form as non-emphatic subject pronouns. This multifunctionality produces a potential for fairly extensive ambiguity, beyond what may arise from homophony, even in orthographies in which all segmental, tone, length and nasalization contrasts are represented--which we shall see is not the case in Nd.

In obtaining forms from a variety of languages, Nd has reduced certain contrasts present in some of those languages in such a way that homophony is fairly extensive. For example, E **hat**, **heart**, and **hurt** have all been sources for Nd **áti**. D **bukken** ´bend over´ and D **boek** or E **book** both have given Nd **búku** ´bend over; book´ (cf. Nd. **bukú** ´mushroom´ < kiKongo [or similar] **buuku** ´mushroom´ [Huttar 1985]). And homophony already present in the source language has sometimes been preserved in Nd, as in **mísi** ´lady; err´ < E **miss**. Thus between so much homophony and so much multifunctionality of forms, one would expect a fair amount of ambiguity even when all phonological contrasts are represented.

But, as intimated above, several such contrasts are not represented in the Afaka script. Contrast between nasalized and non-nasalized vowels is not shown, so that even very common functional items like **de** ´be located; there´ and **den** ´the (pl.); 3rd pl. pron.´ are written alike, as well as specific lexical items such as **deẽ** ´dry´ and **deẽn** ´dream.´ However, through the already mentioned denasalization of nasalized vowels before other vowels, such forms are often homophonous in spoken Ndjuka as well.

Second, tone contrasts are not represented,[3] so that forms like **kíi** ´kill´ and **kiín** ´clean´ (which also differ by nasalization, of course) are written alike. However, the practical orthography now in use for Nd does not represent tone contrasts except in a very few cases, such as the abovementioned contrast between **na** ´be´ and **ná** ´not be,´ a practice which does not seem to be hindering native or non-native speakers from reading texts in that orthography.

Third, there are no special symbols in the script to denote long vowels, so that forms like **báka** ´back,´ **baáka** ´black,´ and **bakaá** ´white man; outsider´ would, if there were no alternative ways to represent length, come out as baka. But there are in fact three ways that users of the script have represented long vowels.[4] The first is simply to ignore the length distinction and use a CV symbol. This is done at least sometimes for 9 out of 22 forms with **ii**, 8 of 18 with **ee**, 5 of 23 with **aa**, 1 of 11 with **oo**, and 2 of 6 with **uu**. Examples are o + gi for **ógíi** ´evil,´ ne + ge for **néngée** ´person; black person,´ and wa + ta for **wátáa** ´water.´

The second is the use of V symbols after CV symbols, so that, for example, **taánga** is written as ta + a + ga, and **sitaáfu** as sI + ta + a + fU. This strategy is used for 3 forms with **ii**, 7 with **ee**, 12 with **aa**, Ø with **oo**, and 3 with **uu**.

To appreciate the third strategy, a bit of background on the relation between Nd and Sr is needed: Almost all Nd long vowels (or sequences of identical vowels), as well as some diphthongs, appear to derive from the loss of intervocalic or prevocalic liquids.[5] If there is a cognate in Sr, the liquid is preserved there:[6]

	Ndjuka	Sranan	Source	Gloss
3.	koo	----	Ewe klo, etc.	turtle
4.	bóo	boro	E bore	bore
5.	boó	blo	E blow	blow, rest, occasion
6.	boón	bron	E burn	burn
7.	kaí	----	P cair	fall
8.	kái	kali	E call	call
9.	fíi	firi	E feel	feel
10.	fií	fri	E free	free

11.	baãka	blaka	E black	black
12.	bakaã	bakra	Ibo, Efik mbakára ´white man´	white man; outsider
13.	kíyõo	kriõlo	P crioulo	young man
14.	bãtãa	batra	E bottle	bottle
15.	bõtõo	botro	E butter	butter
16.	dídíbíi	didibri	E the devil	devil
17.	piisíi	prisiri	D plezier	happy(ness)
18.	afiikãn	afrikan	E Africa(n), D Afrika(an)	black, Africa(n)
19.	sitaãfu	strafu	D straf	punishment, slavery
20.	feẽle	frede	E afraid	be afraid

These examples illustrate some of the correspondences between Nd and Sr: For example, in cases where the two languages have cognates, a CVV̄ sequence in Nd corresponds to a CLV sequence in Sr (5, 6, 10-12, 19, 20).[7] A CV̄V sequence at the end of a polysyllabic word in Nd also corresponds to a CLV sequence in Sr (14-16), but corresponds to Sr CVLV elsewhere (4, 8, 9, 13). A CVV sequence in Nd corresponds to a CLV sequence in Sr (17, 18). Now Sr not only has many forms cognate with Nd. It is also fairly well known to many Ndjukas, especially to those dealing with outsiders--and Afaka himself was such a Ndjuka. Further, it is the language such Ndjukas are most likely to use with outsiders--partly as part of a general effort of keeping outsiders´ knowledge of Ndjuka life at a minimum,[8] partly because Ndjukas rightly assume that most outsiders accord higher prestige to Sr than to Nd, and partly because Sr is well established as a lingua franca, especially in dealing with Ndjukas, whose language is thought of by most outsiders as differing less from Sr than it in fact does. Thus with this knowledge of Sr and with these regular correspondences between most Nd words with long vowels and specific phonotactic patterns in Sr, the option is open to represent vowel length in Nd by representing the corresponding Sr word, or rather an approximation to the Sr word which includes epenthetic vowels added within consonant clusters--what may, in fact, be a diachronically earlier or synchronically underlying Nd form, though I will not try to resolve that question here.

Thus many Nd words with a V̄V sequence and a corresponding VLV sequence in Sr are always or almost always written with CV + LV symbols: e.g., **kíi** ´kill´ is written as ki + lI, **fáa** ´far´ as fa + la, **bóo** ´blow´ as bU + lU, **fúu** ´full´ as fU + lU. Nd words with V̄V but with corresponding LV in Sr are also often written with the same strategy: **ógíi** ´evil´ (Sr **ogri**; < E **ugly**) occurs 7 times as o + gi + lI alongside 6 times as o + gi (see above). This strategy is particularly common for words with **oo**, used in 50 out of 51 word tokens (11 word types); e.g., mU + lU for **móo** ´more´ (Sr **moro**; < E **more**).

But what about Nd words with a VV̄ sequence and a corresponding CLV sequence in Sr, given that the Afaka script has no specific symbols for syllables with CL sequences? Frequently these too are written with CV + LV symbols, as in **biíbi** written as bi + li + bi all eighteen times it occurs. On the other hand, **feéle** (20) is written fe + e + lI all four times it occurs. In fact, the CV + LV strategy is never used for **ee** except for 3 occurrences in a copy of the Lord´s Prayer and Ave Maria (out of 18 word types and 83 tokens).

Examples 18 and 19 above illustrate a Nd CVV (i.e., both low tone) sequence corresponding to a Sr CLV. The three times that **piisíi** occurs in these texts it is always written pi + lI + sI + lI. The form **afiikán** occurs as a + fi + lI + ka 15 times in the texts, and only once as a + fi + ka.

In short, the representation of vowel length in the Afaka script bears further study to sort out the effects of tone, vowel quality, cognate Sr forms, etyma, and possibly part of speech. With some forms written in two or even three different ways, however, it is unlikely that total consistency will be found.

The Nd diphthongs, which correspond to a variety of things in Sr, are represented very consistently in the Afaka script. Of 76 clear cases, only two have simply a CV symbol for the diphthong and its preceding consonant: nU + tu for **noútu** ´need´ (< D. **nood**; cf. Sr **nowtu**), and lI + sI for **leísi** ´read´ (<D. **lezen**; cf. Sr. **leisi**). Otherwise, a CV + V sequence is used in cases where the corresponding Sr form has a diphthong (21) or there is no corresponding form (22),[9] and a CV + lV sequence is used elsewhere (23-25). This pattern is illustrated here for the most common diphthong, **ai**:

	Ndjuka	Script	Sranan	Source	Gloss
21.	**paíman**	pa + I + ma	paiman	E payment	payment
22.	**kaí**	ka + i	(fadon)	P cair	fall
23.	**kái**	ka + lI	kari	E call	call

24.	maíki	ma + lI + ki	marki	E mark	mark
25.	daâi	da + la + i	drai	D draaien	(re)turn

A syllabary, of course, requires a greater number of distinct symbols than does an alphabet to unambiguously represent the phonological units of a language. Thus for a language with CV as the only syllable shape, with m C´s and n V´s, a syllabary requires mn symbols, while an alphabet needs only m+n. Thus a language with 15 C´s and 5 V´s needs 75 syllabic symbols, but only 20 alphabetic ones. For Nd, ignoring for the moment CL clusters, and also ignoring infrequent consonants /h v z/, we have 13 C´s x 5 oral V´s for a total of 65 syllabic symbols needed. The CV sequences wu and yi do not occur, leaving 63. If symbols for V syllables are added, then the total becomes 68. If symbols are added for the /kw ty dy ny/ C´s or C clusters for attested sequences of these and the vowels, since these consonantal elements are already represented with some V´s in the Afaka script, about another 16 symbols are added, giving us 84. If the nasalization contrast in V´s is also represented, we need 168 symbols. If tone is also represented, we need 336. And of course if length and diphthongs were also handled by distinct symbols rather than by various symbol sequences, even more would be needed. As it is, the Afaka script has 56 different symbols for syllables, a significantly lighter memory load than 336 or more. How does the script achieve this economy, and at what cost?

As already seen, nasalization is not represented at all in the script, length is often but not consistently represented by CV + V symbols or by CV + lV symbols, and tone is represented at best only by inference, and that not without a great deal of ambiguity. In addition, many vowel and some consonant contrasts are also neutralized in the script. The following chart shows the phonological value of the 56 characters:

i	e	a	o		(k)u
ki	ke	ka	ko		
gi	ge	ga		gU	
pi	pe	Ba	po		pu
bi	be			bU	
ti	te	ta	Do[10]		tu
di	de	da			du
		kwa			
		tya			

				dyU
fi		fe	fa	fU
	sI		sa	sU
	mI		ma	mU
ni		ne	na	nU
			nya	
	lI		la	lU
	wI		wa	
		ye	ya	yu

Here we have neutralization of the voicing contrast between p and b before a, and between t and d before o. The contrast between Ø and k is neutralized before u. The contrast between i and e is neutralized after s, m, l, and w. The contrast between u and o is neutralized after g, b, dy, f, s, m, n, l. Not symbolized at all are the attested syllables kwi, kwe, kwo; tyo, tyu; dye, dya; nye, nyo, nyu; and wo (which last is symbolized by o in o + lU + ko for woóko ´work´).

The failure to represent the last-mentioned syllables does not exact a high price from the writer or reader, at least in the texts available, where only wo would occur if there were a symbol for it. Since the sample of published texts is fairly narrow in topic, most of them being religious texts or letters made up largely of phatic formulas, it would be extremely helpful to see what is done about these syllables, by no means rare, in a wider variety of texts.

But the other strategy for keeping the number of symbols low, use of one symbol for more than one syllable, has more serious repercussions for use of the script. Even within this range of texts some ambiguities arise, while many others are readily resolved by the linguistic and extralinguistic context. Thus the lack of representation of neutralization and tone means that kíi ´kill´ and kiín ´clean, clear´ are written alike: ki + lI. But in a context such as mUke wI ta na killI fasI ´make us live in a righteous/murderous way,´ the writer´s conception of God and his other requests in the prayer make it clear that kiín is intended. Both síki ´sick; sickness´ and sikín ´body´ are written as sI + ki; and in the line fU mI deesI, a sIki fU mI ´for me to treat my sickness/body,´ the general idea is the same however one takes sIki. The phrase lIbi bUlU could represent either líbi bóo ´life´s breath´ or líbi buúlu ´life´s blood,´ with tone, length, and vowel quality contrasts not represented; yet the gist that the

writer is acknowledging his dependence on God for his being alive is clear, and I suspect a native speaker of Nd would know the sequence as a fixed phrase anyway.

Many potential ambiguities are eliminated by the fairly consistent use of space to separate words, at least in the published forms of most texts. A vertical stroke is used to indicate a major break or pause, but its use is indiscriminate enough that it is actually of little help. Early texts used a horizontal wavy line to mark the bottom of the page, but this device was soon frequently omitted as unnecessary.

In short, despite all the syllables not represented and all the contrasts neutralized, and even given the high degree of homophony and multifunctionality of Ndjuka, the script is fairly serviceable, at least within the narrow range of topics for which it has apparently been used. Difficulties arise chiefly with proper names, which presumably would seldom be a problem for a native member of the community, and when some symbols are written in error. In the latter case, the high degree of underrepresentation makes unambiguous phonological interpretation frequently impossible.

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1. Hereafter Nd. Other abbreviations: D = Dutch, E = English, P = Portuguese, Sr = Sranan. The Ndjukas are also referred to as Djukas and as Aukaners.

2. Among originators of indigenous scripts in West Africa, claims of divine origin for the script and for the promotion of its use have been very frequent (Dalby 1968).

3. That is, they are not represented directly. Some are represented indirectly in conjunction with the indirect representation of some length contrasts, as described below.

4. I base my analysis on the texts (totalling some 500 lines) reproduced in Gonggryp 1960, Gonggryp and Dubelaar 1960, Dubelaar and Gonggryp 1960/1961, and Gonggryp and Dubelaar 1963, many of which have also been published elsewhere.

5. Possible exceptions are **nyuundú** ´otter sp.´ (cf. kiKongo **ǹ-yuundú** ´otter´), **paaká** (cf. kiKongo **m̀-pàka** ´a wood grouse´) and other words of African origin. See Huttar 1985.

6. Sranan forms are from the 1980 Woordenlijst. See Smith 1977, Sebba 1982, and Smith and Huttar 1984 on the liquids in the Suriname creoles.

7. An exception is the set of forms beginning with **w**, such as Nd **waán**, Sr **waran** ´warm,´ Nd **woón**, Sr **woron** ´worm´ (with stress on the second sylllable in the Sranan forms).

8. Note Green 1974:15 on another creole-speaking group of Suriname, the Matawais: "Speaking Sranan to all outsiders is the Matawais´ ´first line of defense´ that protects their cultural integrity."

9. I take Sr **komsari** ´commissioner´ not to be wholly corresponding to Nd **komisaísi**; hence the representation ko + mI + sa + i + sI is not exceptional.

10. Published charts of the characters (e.g., Bonne 1920, Gonggryp and Dubelaar 1963, Dubelaar 1980) give one symbol for **do** and **du**, another for **to**. However, both in my reading of the texts and in these other writers´ transcriptions, the first symbol always represents **du**, and the second one very frequently **do** rather than **to** (12 cases of **do**, 16 of **to**, and 2 uncertain). I therefore depart from the published charts in the summary here.

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IV

MORPHOLOGY AND SYNTAX

TOWARDS "PERFECTIVE" CO-TIME
A STUDY OF THE PROGRESSIVE IN ENGLISH

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1 The aim of this paper is to show that the way seem/appear, as-clauses and the progressive are used in English proves the correctness of Gustave Guillaume's view of language. Guillaime, emphasizing the link between human thinking and language, claims that human thought and language are creations of contrasts. The important contrast between space and time is said to be the "ultimate contrast" (p. 9), by means of which unthinkable non-contrast is eluded. According to Guillaume, it is the linguist's task to translate back what is "sayable" and then produced in language into what is "seeable" (p. 26). In doing this, the analyzing linguist must come to grips with the very important contrast betwen the active interiorizing forces which lead back to the "seeableness"of underlying mental acts, and the active exteriorizing forces which transfer "seeableness" into "sayableness". The interiorizing process is said to be exclusively mental, while the exteriorizing process is a "mutation from mental to physical" (p. 32). He accuses the traditional linguist of not being "scientific enough":

> In other words, the error of traditional linguistics has been its failure to see (with the mind's eye, the eye of understanding) that any interiorizing step calls for an equal exteriorizing step, and that what we know of the means of exteriorizing language thereby helps us to see what the mental, interiorizing means must have been. Thanks to this symphysis, a true science of language can be built. (p. 72)

Guillaume stresses the operational aspect of language, which consists of a constant search:"Something resembling a search for complex conciliation - another word for harmony - between elements not flatly contradictory is to be discovered in these inner activities of the mind which are reflected in the structure of language and nowhere else." (p. 151)

My analysis of the progressive in English has shown that the stem of the verb, which I will call Y (Y represents a word in general), stands for an interiorizing step which calls for an equal exteriorizing step in the form of the suffix -ing:

Fig. 1

Y	ing
i	e
(=internal)	(=external)

2 At a presentation of a preliminary version of this paper in Umeå I was asked in what way the proposed analysis differed from the traditional view that "Y is a label of a belief or an opinion". What was also challenged was my use of the term "transform" in my account of the relation between (1) and (2):

(1) X appears as Y.

(2) Y appears as X (temporal as-clause). (See below for genuine examples).

In my preliminary version I was claiming that (2) is a transform of (1). I am now able to give more precise answers to these questions than I was at the time when I was first confronted with them.

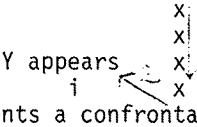
2.1 The semantic principle expressed in the first question (concerning Y being a label of a belief) epitomizes the fault of traditional linguistics in that it represents a view in which the human mind is looked on as a mechanical device like a camera. A camera produces a picture of an external phenomenon, which I will call X. The produced picture can be said to be a "label" that is produced in a "thought process", in this case the mechanical process that makes the camera function. The produced picture can be picked out at will to represent X; the picture can be called forth as a finished product without any knowledge whatsoever of the process in which the picture was produced. In a language, on the other hand, a word, Y, is a picture (of an experience X) that has to be reproduced whenever it is selected, i.e. the process in which Y was created is repeated.

2.2 That the selection of Y presupposes a repetition of the process of labelling is a fact that is proved by examples with appear and seem. Consider first:

(3) Psychical blindness is a condition in which there is total absence of visual memory-images, a condition in which, for example, one is unable to remember something just seen or to conjure up a memory-picture of the visible appearance of a well-known friend in his absence. (The Brown Corpus)

This example, in which visible is an obligatory collocate of appearance, shows that the selection of Y (the memory-picture of a friend) is based on a capacity to repeat the process in which Y was created. The creation of an appearance is the outcome of the mind's processings of repeated encounters with the friend as can be illustrated like this:

Fig. 2



Each X represents a confrontation and Y represents a certain person's interpretation of X. Appear is internal in that it stands for a personal impression of X in an encounter. The formation of this appearance can be illustrated like this;

Fig. 3

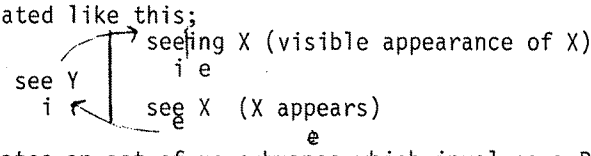
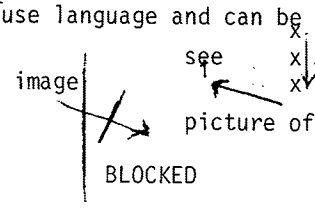


Fig. 3 illustrates an act of remembrance, which involves a RECALLING of see Y, i. e. the memory-image of see Y is withdrawn, conjured up, from the mind, thereby becoming a visible image/appearance, i.e. the internal image can be seen transitorily. We note here that visible image is a possible collocation, whereas *visible picture is not. This reexternalization, or representation (in the sense that see X is presented again) of see X is matched by the appearance of the suffix-ing/

visible in the sentences "I am seeing X" and "I conjure up the visible appearance of X". A person suffering from "psychical blindness" is unable to perform this operation, i.e. he is unable to"remember something just seen". From this follows that he is unable to release, conjure up, a picture., i.e. a representation of the visible appearance of the friend in his absence. This corresponds with inability to use language and can be illustrated like this:

Fig. 4



(See)ing and visible (appearance) represent a particularization, i.e. the last X in a series of perceptions stands for a particular reexternalization of see and appear which is an improvement on the preceding perception (see arrow 2 in Figs. 3 and 4). Arrow 1 signifies a progressive perceptual precision, i.e a progressive liberation from dependence on external circumstances attending the perception. When the point represented by the last x in the series has been reached, X can be conjured up in the absence of X, i.e X can be REcalled instead of Y RECALLED . This means that X can be called Y again even it is far away in space and time.

3 Ljung (pp. 62-63) claims that be in "John is angry" is "transformationally inserted", whereas seem in "John seems angry" is said to be "inserted in underlying structure". However, he regrets the fact that he has no evidence for this assumption (p. 63). He forgoes the chance of providing such evidence when he takes the step of postulating two different verbs seem, "He seems angry" (seem 1) , and "He seems to be angry" (seem 2). Seem is the same verb in both cases, but be in the latter instance differs from be in "X appears to be Y" in that the former be (henceforth called BE) is a transform of the "deep" be (henceforth called be). We arrive at this conclusion by considering the meanings and functions of appear and seem. As is obvious from such an example as "A car appeared", appear means something like 'become visible', but it is more difficult to define the meaning of seem. Webster's "Third" gives the definition "be in appearance", which I have found to be a fruitful one in my analyses of the examples in my material with seem, roughly comprising 2000 examples. This definition indicates that seem is concerned with the innermost core of language as a uniquely human phenomenon. Language must have arisen through a systematic analysis of perceptions in order for them to be attached to symbols. The first step in such an analysis is to examine the object of perception, but language could be created only if this first step was immediately followed by an analysis of the perception as an activity or process.Guillaume emphasizes repeatedly that language and human powers of thought are based on the mind perceiving its own activity. Linguistics as a science must be concerned with thia process: "However, it (linguistics) leads us furthest into a knowledge of the means whereby thought manages to get a clear apprehension of its own processes." (p. 13).

As will be shown below, if we trace the process through which the mind becomes aware of its own analysis of a perception, we will see how be is transformed into BE. This process consists of five stages as the following figure will show:

Fig. 5

```
I X appears as Y
      e     i
II X seems Y                        (as)
   (X is Y in X)  (see Y)            e
        i            e
III a) X appears to be Y (but) (*as)
     i     e       e       i
    b) X is Ying                  (*as)
     i    e i e
IV a) recall X appears Y as X
      (see)
       i         e   i    e
   b) recall seeing Y as X
      (see)
       i      i  e (e i) e

V a) I am recallING  SEE(ing) Y as X
          (seeING)
       i    i    e    i   (e)    e
   b) X2is seeming to BE Y as X1
        i  i   e          e
   c) X2is BEING Y as  X1

   d) X1 IS Y
```

The configuration in I corresponds with such examples as:

(A) Palmer appeared, in my generously admiring vision of him, as a complete and successful human being. (Iris Murdoch)

(B) From the lioness' point of view, this strange creature on the back of another creature, lashing out with its long thin paws, appeared as something she could not cope with. (The Brown Corpus)

Here, the perceptual act is specified, indicating that circumstances attending the perception are taken into account. The internal as in I appears externalized in II, forming a temporal as-clause. As is optional here, but it is not allowed in III. In IV and V, on the other hand, it is obligatory. We conclude from this that as plays a crucial role in the process illustrated in Fig. 5, and we would expect to be able to see its significance after examining each of the stages constituting the process.

3.1 As we can see in Fig. 5, what we are specifically concerned with here is the relation between II, represented by for example "He seemed nervous as he entered the room", and Vb), where seem occurs in the progressive form. This is represented by:

(4) Cates was seeming to ignore them as he walked about the store serving the few white customers. (Alex Haley)

In my material of examples with seem, I have two instances of seem in the progressive, the other one being:

(5) I knew that I was not only feeling but also seeming appallingly guilty. (Iris Murdoch)

Although I have not yet tested it, I am pretty certain that to be could not be left out in a different version of (4), "he was seeming to be nonchalant", or included in (5). Thus, know somehow replaces both as and to be.

As we see from Va), was represents a reinternalized be, since the originally internal be in "X is Y in X" included in seem is externalized in III. The -ing-suffix is transferred from the original see and is thus represented with another verb form (it is made present again). The original see, as a result of its losing the-ing-form, is transformed into SEE. This transformed SEE yields BE. This transform acquires the -ing-suffix in Vc), which anticipates Vd), where time is liberated, i.e. it is no longer locked in an -ing-form, and X1 replaces X2 as the subject of IS. This liberation has also occurred in Vb), where seem assumes the burden of time, thereby setting to BE free.

What is illustrated in Fig. 5 is what Guillaume calls "the circuit of the mind" as it undertakes the task of constructing thought and language. Our next step will be to examine how Guillaume's hypothesis as to a "center of inversion" in that circuit can be integrated into my analysis. We will start by considering what Guillaume says.

3.2 The whole constructive mechanics of language is the movement of thought - the interiority of the mind's movement - encountering a centre of inversion within itself. In a diagram, it may be represented something like this:

$$U1 \longrightarrow \underbrace{S(ingular)}_{1 \text{ and } 2} \longrightarrow U2$$

Let us take a closer look. A universalizing movement of the type U1 ⟶ U2 (interiority alone with no exteriority)is unthinkable. Exteriority must be reinstated, by inserting interiority, so that there may be a contrast between an infinitely containing exteriority and an infinitely contained interiority. (p. 162; my underlining;UB)

Recall in IVa) represents insertion of interiority, and in IVb), this interiorizing step is obligatorily followed by reinstatement of exteriority, i.e. the external"see y" included in seem in II is reinstated. This occurs inverselyin that ei, deriving from "X appears Y" in IVa), crops up as ie. However, only in Va) can a proper inversion occur, and it is formally marked by the transfer of -ing "to the left", leaving the transform SEE to mark a proper reinstatement of exteriority. Thus, we conclude that the mind's circuit consists of the successive stages from see to SEE, and these two poles mark the two universals (U1 and U2) in Guillaume's diagram.

3.3 Just as to be is necessary in a different version of (4) and impossible in (5), so it is impossible in :

(6) I felt I was appearing an irresolute commander to those watching me more or less critically (Joseph Conrad; this example is from Hirtle)

Example (5) corresponds with the image of something infinitely containing, whereas (6) evokes the image of something infinitely contained by the premature locking of time in appearING.This will be

clearer if we compare the three examples in a diagram:

Fig. 6

1) Va) i i e to BE Y e int inserted, ext reinstated
felt was app-ing Y watch

2)(6)i e i e i e int inserted, ext not reinstated
knew was seeming Y

3)(5) i e i e int not inserted, ext reinstated

In 2), the leftmost i and the rightmost e balance each other, thus as it were cancelling each other out, and this is also the case in 1), where ie is thus all that remains. This represents the ideal end-point in the mind's circuit, at which to BE Y is liberated. In 2), on the other hand, the rightmost i stands for a reinternalized be (internal in seem Y, external in "X appears to be Y" and in "X is Ying"). In 3), the leftmost i (knew) is not balanced by a rightmost e as in 1) and 2), i.e. seeming does not collocate with an as-clause (watch in 2) replaces an as-clause). This means that seeming in 3) does not have a time frame with which the time locked in -ing can be matched. This is not necessary here since knew marks established awareness of a perfect match of time (there is "perfective" co-time between seem and an implied X). In 2), felt expresses a hypothesis as to "perfective" co-time, whereas in 1), there is perfect balance between i and e in the form seeming in that the surrounding i and e cancel each other out. "Perfective" co-time prevails. Since knewin 3) replaces as as an obligatory collocate of seeming, we conclude that an optional as-clause signifies a hypothesis as to co-time that is satisfied in cases where the as-clauseis obligatory. Another inevitable conclusion is that felt and watch are obligatory collocates of appearing in 2).

The analysis of Fig. 6 will be confirmed if we consider that 2) expresses a guess, based on an observation of watch, as to how the critical observers see the appearance, "I see THEY see X appears Y". The encoder sees himself forced to resort to conjecture since he is unable to verify the appearance by extracting "see appearance" from his mind. Further confirmation is offered by the fact that knew in 3) represents a short cut to the goal of the mind's circuit. Knowledge forestalls a check as to co-time, and so interiority needs not to be inserted. In 1), the second i derives from ie in seem, and thus, the leftmost i is the inserted interiority, and the e represented by -ing stands for the reinstated exteriority.

4 The analysis in Fig. 4 is supported by the following collocational facts.

4.1 Seem Y collocates significantly with as-clauses, whereas appear does so only in exceptional cases, as in:

(7) An eyewitness recalled how awkward the red-turbaned colored women appeared as they curtseyed in the church doorway... (The Brown Corpus)

which represents stage IV in Fig. 4, and:

(8) Another theme, sinuously chromatic, appears as he directs her to gain power over Grigory by any means... (The Brown Corpus)

Example (8) symbolizes the selection of a word Y for the perception X, "he directs her etc.", in an ad hoc manner, since the assignment

of the name theme to X lacks appeal, i.e. the speaker feels free to call whatever he sees fit a theme without having to check his selection of Y against a previous visible appearance of a "theme". In (7), on the other hand, such a check must provide the basis for the selection of Y, and here recall marks the extraction of a visible appearance from the mind.

4.2 "X appears to be Y" collocates significantly with a but-sequel, as in:

(9) Your arguments appear to be most convincing, but the evidence may bear some other interpretation. (Dorothy Parker)

Seem, which collocates significantly with an and-sequel (see Bäcklund, forthcoming), confirming seem's relevance for processes of conceptualization (seem represents analyses of perceptions), collocates with a but-sequel only in two instances in my extensive material:

(10) She seemed to be laughing, but he wasn't sure. (Elia Kazan)

(11) He seemed to be sleeping very peacefully, yet she had a feeling that he had awakened and recognized her tread. (Elia Kazan)

It follows from the discussion above that this is the only case where Ying is preceded by BE, a transformed be. These examples have the underlying configuration "ie (seem) to BE ie (Ying)", which expresses a premature hypothesis as to "perfective" co-time, since to BE is left free, as if it were liberated in time. The mind's becoming aware of the premature nature of this hypothesis must be marked in the form of unlocks, be sure and have a feeling. But while the mind thus abstains from checking its hypothesis in (10) and (11), it automatically performs a check in the case of "X appears to be Y", which is always followed, explicitly or implicitly, by a but-sequel. Thus, in (9) and similar examples we witness the formulation of an abstract appearance or an image of see Y, i.e. the but-sequel expresses operations in which the mind is freeing itself from dependence on external circumstances attending the perception. This is why "X appears to be Y" does not collocate with an as-clause.

4.3 Example (7) illustrates the process of adverbialization in that it is a prestage of "They curtseyed awkwardly", and the underlying structure is "I see them curtsey awkwardly", where co-time is about to be established between see (seeing) and curtsey through a withdrawal of the image of 'see awkward'. Such a withdrawal is not foreseen in:

(12) Warrender's voice broke; he appeared, alcoholically, to be stifling a sob. (Arthur Hailey)

Here, there is hypothetical co-time between (see) appear and stifling. Preliminary testing has indicated that the following example is not natural English:

(13) *He seemed, alcoholically, to be stifling a sob.

Of course, this also applies to:

(14) *He alcoholically stifled a sob.

The following two examples, on the other hand, are acceptable:

(15) He was, alcoholically, stifling a sob.

(16) I saw him alcoholically stifle a sob.

As we have seen, proper adverbialization presupposes that co-time can be tested. That is why (13) fails, since this sentence expresses a premature hypothesis as to co-time, as we have noted. (15) and (16), on the other hand, allow a test as to co-time. However, in such a test, alcoholically would cease to be a candidate for adverbialization.

This shows two things. First, a proper configuration for the progressive in English would be the following:

Fig. 7

be Ying
(i)e i e

where the bracketed (i) represents the explicit or implicit presence of an unlock, i.e. an element expressing a mental activity, "see/realize etc. be Ying". Second, manifested language is not restricted to the result of the mind's completed circuit from see to SEE (from be to BE). Thus, processes responsible for the creation of language still play an important role in the use of language. We will discuss the first point a little more in detail.

5 Consider:

(17) Imagine I'm seeing the Mona Lisa at last!(From Ljung)

Imagine seems to function as the optional (i) in Fig.7. Also, it suits the discussion admirably, since it suggests "withdraw IMAGE of 'see Y'". Now, let us envisage a situation in which somebody sees a forgery of the famous painting and that he is imagining that he is seeing the genuine picture:

(18)I imagined I was seeing the M L (as I saw the forgery).

The progressive of see is obligatoty here, but the as-clause is optional. Now, if we put imagine in the progressive, we would get:

(19)I was imagining I was seeing the M L (as I saw the forgery)

The as-clause is still optional.However, in:

(20) I was imagining 'see the M L' as I saw the forgery.

I feel that the as-clause is obligatory.'See the M L' is as it were the description of a game, the playing of which has co-time with the as-clause. If we consider it carefully, we will find that this exactly the same as example (4) and Vb) in Fig. 5:

Fig. 8

a) imagine I am seeING SEE(ing) Y as I see forgery

b) know I am seeING SEE(ing) Y as I see him walk...
i i e i (e) e

We have claimed above that the obligatory as has an internalizing function in that it reinternalizes be in example (4). Fig. 8 allows us to get a clearer insight into this internalization. Obviously, it involves two operations. First, the transformed SEE is inserted, thereby transforming the external be fromIIIb) into an internal be . Second, the unlock know merges with see which is acquiring the -ing-form. This tallies with psychological facts. The transformed SEE is the new image that replaces the old one that is extracted (seeING). Thus, see1 seeing2 becomes SEE2 seeING1(=SEE knowING; the unlock SEE confirms that seeING merges with knowING).This is what Guillaume refers to as the "inversion", in which a "viewing" idea (a representation locked in the mind) becomes a "viewed" idea and vice versa .

We conclude that b) in Fig. 8 means "I KNOW that SEE has co-time with as" and that a) implies"I IMAGINE that see has co-time with as. Put somewhat differently , a) means "The IMAGE of see the Mona Lisa covers 'see forgery' exactly". What is anticipated in (17) is for the INTERNAl perception to cover exactly the EXTERNAL image of

'see forgery'. An as-clause is not necessary or indeed possible because the internal object "the Mona Lisa" balances the leftmost e, represented by be (Ying):

Fig. 9

am seeing the Mona Lisa
e i e i

Now, this is obviously a stage that precedes the mind's encounter with the "center of inversion", since the relation between the two end-poles has not yet been inverted to yield the configuration "i i e e" as in Fig.5 Vb). It follows from this that "be Ying" is a premature version of the final solution "be seeming (to BE) Y as X", but such a preliminary solution strives for a definite solution,of course, and this ideal state is accomplished at stage V in Fig.5.

5.1 The external object of a verb of perception involves an active seeing, implying a movement towards visibility (see seeing), while the internal object of a verb of perception involves a passive seeing in a movement away from visibility as it were ((seeING SEE(ing)). This is the reason why the progressive of see cannot take image as its object:

(18) "That's right, you can only see my image." (*are seeing) (Joan Collins on New York TV)

(19)You are seeing my picture. (*image) (Concocted example)

(18) was uttered as a response to the regret expressed by a viewer, with whom Joan Collins was having a telephone conversation while appearing on the screen,that the real person Joan Collins could not be seen. Through this utterance the viewer is requested to create his own image of the person appearing on the screen, and this image can then be stored in the mind as a result of the mind going through the "center of inversion". (19) would be uttered by a person whose appearance is represented on the screen by means of a photograph. Rather than being an admonishment towards an active seeing, as in (18), it is simply a call for attention, implying: "I hope you are paying attention". Compare:

(20) "You are hearing Mr Koch thank his campaign workers." (New York TV, 13 October 1985)

(21) "We are hearing Mr Arafat repeat the argument he has used so often before." (New York TV, 3 November 1985)

(20) was uttered by a newscaster as a comment on what was being displayed on the screen. If he had said "You can hear that Mr K is thanking..." , he would have been asking the viewers to make 'thank' visible, which was felt to be superfluous in the context. This would correspond with the formula:

(22) (i) e e
hear + object

By rexternalizing hear, i.e. by activating the bracketed (i), the speaker is moving the external object to the left, thus admonishing the viewers to make 'hear' visible:

(23) i e i e
SEE are hearing

Thus, the activation of (i), implying a representation of Y (Y is made present again), functions as a call for attention. In (21), which was used in a debate, the use of the progressive has a subtle persuasive effect. By directing the focus on hear rather than on repeat, the speaker is intimating that the argument heis advancing is a matter of course. We note that the internalization of the object of hear in these examples correspondswith a transfer of -ing to the left.

5.2 The following example illustrates the insertion of interiority in a striking way:

(24) "You have been wonderfully good to me," he said. "I owe you everything. But I must go.All this has only made sure what I have been knowing this long time that I ought to do." (From Hirtle)

The verb know, contrary to what is the case with a verb of perception. has an internal object, as in "I know what to do". This has made sure in (24) externalizes this internal object by suggesting "This is what I ought to do". This externalization extracts the object of know, making it visible: "I SEE what I have been knowing that I ought to do". Thus, interiority is inserted here:

Fig. 10

i e i e (e)
SEE be knowing that I ought to do

Thus, the "extra" that(what /=that which/ I have been knowing that...) is substituted by the internal SEE. As we have seen, the progressive always implies a reconsideration, or a representation, of the verb. This representation coincides here with a reassessment of the value of know:'think I know' becomes 'know for sure'. We also note that this reassessment coincides with liberation of time manifested in this long time. Compare:

(25) But his only response was a slight shake of the head and an almost apologetic expression on his face, which indicated that he was not understanding either my words or the meaning behind them. (From Hirtle)

(26) I also repeated the answers he gave me to be sure that I was understanding him correctly(From Hirtle)

(27) He looked intently at me to see that I was understanding what he wanted me to do. (Hirtle)

These examples confirm that the rationale for the progressive is stating inadequate knowledge, thus calling for attempts to achieve optimal knowledge.That the progressive is a reconsideration of the verb is proved here by modification of the object, by means of the semantic nature of the object in (25) and by means of an adverb in (26), and by the fact that there is an intentional implication in (27), "to see to it that..." Now consider:

(28) "Are you walking fast?"

(29) "Connie is having 20 minutes."

(28) was uttered by an American friend of mine who was accompanying me on a walk. It seemed I was settimg the pace.It is not actually the image of the activity itself that is called forth by the progressive, but rather the image of the speaker's knowledge. He is appealing to

my image of 'walk fast', the implication being: "Is this your image of 'walk fast?" (29) was uttered by the chairman of a session at a LACUS meeting, making a correction of hisassumption that the speaker he was introducing had been given merely the customary 15 minutes for presenting her paper. The progressive here marks a newly established realization, as was evident in the situation in which it occurred. The introduced speaker, as she passed the chairman, bent down and whispered something in his ear, after which he rose to make his statement. Rather than expressing a decision, as some will have it (see for example Hirtle, p. 93 f.), the progressive, it seems to me, here expresses newly established knowledge.

In the following example, the progressive would not make sense unless it was taken to signify an appeal to others to share a whim:

(30) "I'm leaving."

This was said jokingly by the famous jazz musician Dizzie Gillespie at a New York jazz club, when he found there was no response to his question if there was anyone in the audience who knew Hebrew. No genuine inintention is expressed here, of course, which must be formally expressed in Swedish, where an unlock is required: "Jag tror jag går"/="I think I'm leaving").

Internalness as far as the object is concerned means that the object is present only while the act of perception lasts. Consider:

(31) If the cat exists whether I see it or not, we can understand from our experience how it gets hungry between one meal and the next, but if it does not exist when I am not seeing it, it seems odd that appetite should grow during non-existence as fast as during existence. (From Hirtle)

Negated seeing necessarily implies non-existence for the object, i.e. if there is no perfect knowledge as to the validity of 'see', the existence of the object is denied. Hirtle comments (p. 74): "If the object exists only in the mind of the perceiver, its very instability can occasion the progressive, no view of the whole being experienced." But it is not the object that presents an imperfect view; it is the validity of viewing that is missing.

The following example represents one step further towards interiorization as compared with example (6):

(32) She was conscious that he was seeing her to her utmost advantage. (From Hirtle)

As can be seen in Fig. 11, there is a parallel between (6) and (32):

Fig. 11

A felt she saw him see her appearing Y to the man

B was conscious she saw he was seeing her

However, in B, it is obvious that the interiorization proceeds further in that the progressive can move one step to the left. The object of seeing is internal in the sense that the time of observation is limited, or rather defined, by the time indicated by appearING in A. The progressive can move one step to the left because the subject of be conscious is in control of what is to appear, i.e. she is free to see to it that her observer sees her to her utmost advantage.

5.2 The following examples provide us with further evidence that the progressive signifies a reconsideration of Y.

5.2.1 A "collective" seeing is being referredto, i.e. many instances of a perception are looked on as a single unit.

(33) Iam seeing the sights of Paris.(From Hirtle)

(34) I am hearing lectures. (From Hirtle)

5.2.2 A perception is being compared with an earlier event.

(35) I am hearing it better now, and I am seeing it more clearly now. (From Hirtle)

5.2.3 The perceiver is subjecting his perception to a careful analysis.

(36) Poirot was seeing the face of a girl with red hair and hear- a voice say...(From Hirtle)

Poirot, being a detective, perceives his own perception to ensure its trustworthiness.

6 It follows from the above discussion that "be Ying" means "see image of Y", while "seeming to (BE) Y" means "see image of 'see Y'". As can be seen in Fig. 5 Vc), the latter configuration implies also "see image of 'be Y'" , and since the as-clause is obligatory, the real implication is "X is image of 'be Y'". Now, an as-clause is of course possible only in an underlying representation of "seeming to (BE) Y", i.e. it is not allowed in for example:

(37) You are being sarcastic. (Concocted example)

Here, as is as impossible as with "be Ying" and "X appears to be Y". Hirtle (p. 83) considers "be being Y" "incomplete action", while Ljung (p. 85) says that the sentence "You are being dense tonight" "asserts that your actions meet the description 'be dense'". What is actually asserted is that "your actions make me see the image of 'be dense'", and what is incomplete is the seeing of this image. We will see what this means in terms of Fig. 5. ""Be Ying" and "be being Y" both imply reinstatement of exteriority without the preceding insertion of interiority, as is shown in:

Fig. 12

A be Ying	be+i+time
B be being Y	be+time+i

As can be seen in Fig.5 V, the goal is "i+be+time+. We note that in Fig. 12, Y, coinciding with i, is internal, whereasit is external in V in Fig. 5 ("to BE Y" is liberated in time). Now, Fig. 5 shows that appear is an obligatory intermediate stage in the mind's route to the goal in V. Schematically, the difference between IIIa) and IIIb) in Fig. 5 is:

Fig. 13

IIIa)	i	e	e	i
	1	2	3	4
IIIb)	i	e	i	e
	1	3	4	2

We find that -ing corresponds with appear and that the rightmost i in IIIa), but, corresponds with Y in IIIb). As we have seen, the but-sequel in IIIa) constitutes anticipation that another Y may appear after a more thorough examination of X. Now consider:

(38) That it appeared to be an entirely innocuous industry was evidenced by the fact that tourists who occasionally happened by were smilingly invited to come inside and look around. (Alistair McLean)

Schematically, (38) can be represented as:

Fig. 14

I see X appears to be Y A
Evidence appears B

See in A is contained in evidence in B , since evidence implies: "my interpretation of what appears". This internalization of see is necessarily accompanied by internalization of be (*"evidence appears to be Y"). We concludethat it is the goal for the rightmost i in IIIa) and IIIb) to be integrated with the leftmost i. This occurs in IV and V in Fig. 5, and since as is obligatory here while it is impossible in IIIa) and IIIb), we see now that it is the task of as to insert interiority. IV in Fig. 5 represents a futile attempt to insert interiority. It is doomed to fail because be is notreexternalized. However, in V, such re-externalization occurs, and thus, as performs its task. In IV, ie (ei) corresponds with "Ø + time" (be remains internal), while in Va), we have:

Fig. 15

i i e i (e) e is seeING SEE(ing) as

The arrow signifies representation of-ing (-ing → -ING), and the outcome is TIME + BE. As interiorizes be and SEE (SEE replaces see through inversion), and in the inversion TIME + BE becomes BE + TIME (BEING). This inversion can be illustrated like this:

Fig. 16

A i e i e

B i i e e

In B, there is perfect harmony between the two is and the two es. At this point, "evidence appears" in Fig. 14 has been replaced by the formula:

(39) Y appears as X. (a temporal as-clause)

This implies that dependence on circumstances attending the perception has been replaced by pure perception.

6.1 Now, in the use of "be being Y", as, for example, in:

(40) I am being sober tonight. (From Ljung)

no as is allowed to internalize be and SEE, i.e. BE does not derive from SEE as in V in Fig. 5. This responds to a need to use words unconventionally, i.e. to link Y with an X in an "unusual" way, as in (40), which means:"I see image of 'be sober' in my declining offered drinks". This is the explanation why "be being Y" is found to be even more "agentive" (see Hirtle and Ljung) than "be Ying" and why "be being Y" can refer to adopted behavior, as in:

(41) He is being Napoleon.

7"Mechanistic"linguistics fails to take into account that language is a dyadic relation betwen a mental and a physical component. I will discuss a few points in Ljung to illustrate this.

7.1 In discussing (p. 120) the example:

(41) Mary is saying that she doesn't like Greeks.

Ljung makes a distinction between an "interpretative" and a "non-interpretative" reading. In the latter version, say is claimed to be an "event-denoting"verb, while in the former case it is asserted that say is a "state-denoting" verb. The former version, Ljung says, means "what she is doing actually amounts to saying... " (my underlining; UB), as if the meaning of the progressive of say was totally unconnected with the meaning of the simple form say. According to Ljung, Mary's utterance is

simply repeated in the latter case, whereas it is reformulated in the formercase. In my analysis, the progressive saying is a reconsideration of the simple form say, i.e. the original utterance is either reformulated or it is implicitly stated that the speaker is attaching a specific attitude to the repeated utterance, according to the formula:

(43) She says X and as she says X, she is saying Y (or: speaker is applying an attitude to X)

7.2 Just as in the case of say, the progressive of verbs of perception is said to be "understood as interpretation of human acts". (p. 89). Thus, Ljung comments on:

(17) Imagine I'm seeing the Mona Lisa at last!

and

(44) Thank God I'm seeing the last of this car!

as follows (p. 89):"What all sentences with sensation verbs in the progressive have in common, then is...that they all must be understood as interpretations of human acts." On p. 90, Ljung specifies the acts that are interpreted by the progressive forms in (17) and (44):"The behaviour in the examples above is the situation that the speaker finds himself in, i.e. standing in front of a certain picture in the Louvre and being busy making preparations for returning a car that has been giving a lot of trouble." However, these are elaborate inferential meanings of see and cannot be claimed to be part of the linguistic meaning. (Cf. Ruhl for a discussion).

7.3 In accordance with his view of the progressive, Ljung claims that the sentences:

(45) (Where is John?) ---He is seeing his lawyer.

and

(46) Joan is hearing voices telling her to save France.

are interpretations of the subject's behaviour, consisting of attempts to "change reality". Just as (46) implies such an attempt in that it refers to a hallucination, so does (45) according to Ljung, since "John has had to 'change reality' to meet his demands" (p. 89). But the only thing the speaker is concerned with is the question whether there is validity for the use of the verb see. Thus, in both cases, the progressive expresses uncertainty as to such validity: in (45), implying "As far as I know, he is seeing his lawyer", there is uncertainty as to the validity of see itself, and in (46), there is uncertainty as to the validity of the object ofhear (the object is internal).

8 These differences between Ljung's analysis and mine, although they may appear to be trivial, reflect profoundly different views of language. Ljung treats language as if it were a self-sufficient mechanical automaton. Mechanistic analyses such as those that I have discussed above evoke a situation in which people do not think before they speak. This is most evident in Ljung's treatments of the verbs call and look.

8.1 Call is said to be a "performative preface" and is equated with suggest according to the following diagram (p. 101):

(47) Utterance

Illocutionary force	Propositional content
I call	that is unfair
I suggest	we leave

In the statement "I call : 'X is Y'" , call, far from being a "performative preface", represents performance, since it is a synonym of shout / cry out. As is evident from the above discussion, this situation either refers to a primitive stage in the development of language where this is X2, i.e. the internal subject for be, and is is the "deep" untransformed be or the stage where is is the transformed BE and this stands for X1, i.e. for the external subject for BE. In both interpretations, since it is claimed that call is a "performative preface", language is treated as if it were not based on the crucial "center of inversion", where time is liberated to yield BE. Technically speaking, this analysis fails to take into account the crucial distinction between RECALL and REcall, i.e. it implies that a newly observed situation is RECALLED, but X is not called Y again , i.e. an X cannot be evoked in the absence of X, which is the touchstone of any definition of language. The latter situation must be rendered by "I call XY", where be is internal, anticipating BE in a later operation.

8.2 In accordance with the standard polysemic treatments in "mechanistic" linguistics, Ljung claims (p. 60) that the sentence "John looks sad" has two different interpretations:

(48) □ look John sad.

(49) I look John sad.

□ stands for "'no particular experiencer' or something of the kind, and I stands for the speaker" (p. 60). Thus, in (48), the judgment that is expressed is left as it were hanging in midair with nobody to take responsibility for it. (48) is said to represent the version that can occur in the progressive, and (49) is another version that does not allow the progressive form, since "the progressive should be impossible when what is involved is the impression made on the mind of the experiencer" (p.61). According to Ljung, this is the reason why the progressive is impossible in:

(50) John looked happy to me.

and

(51) John looked capable of doing the job.

The complement in (51), the argument goes, is based on a subjective evaluation, while capable alone is more "objective", and so the progressive is possible:

(52) He is looking capable.

According to my analysis above, the difference between the simple form and the progressive of a verb with a complement like look can be illustrated like this:

Fig. 17 look + c be looking + c
(i) e e e i e i

The bracketed (i) represents an unchallenged assumption of responsibilty for the judgment. Here, the complement is external. An external complement is a transformed internal complement, and a subjective judgment like "capable of doing the job" is thus external. An internal complement, on the other hand, is formulated while an image of the complement is being formed, i.e. while the speaker is looking for justification for his choice of a word, and here only an unmodified capable is possible. With the progressive the assumption of responsibility for the judgment is being challenged, either by the speaker himself or by somebody else, and so the

the bracketed (i), which is dormant, is activated, i.e. i is represented, made present again. This representation can be explicitly marked, as in (50) , where to me activates the bracketed (i). With the progressive, on the other hand, the -ing-form automatically activates the bracketed (i), and so to me is impossible, since it would be tautological. We note two things in particular.First, it is not the activity denoted by the verb itself that is represented, but the speaker's way of observing the activity. It is not the label but the act of labelling that is represented.Second the reason for the use of the progressive is the opposite of what Ljung claims it to be: the progressive is an indication that the speaker is being challenged to explicitly assume responsibilty for the judgment.

8.2.1 Let us compare this with two collocational characteristics of seem . First,"seem to be +adj./progressive", where be is a transformed BE, as we have seen, does not allow an explicit experiencer:

(52) *He seems to be nervous to me. OK:He seems nervous to me.

Second, as already noted, the progressive of seem is not possible with be remaining internal:

(53) *He was seeming nonchalant as he walked...OK: He was seeming to BE nonchalant as he walked...

As we have seen, this is due to the factthat seeming marks the point in the mind's circuit at which BE is externalized or exteriorized.

9 Ljung's confirms his mechanistic outlook by claiming that such sentences as "I am hot" and "I am angry" are "pure expressions". Commenting on Berrand Russel's statement that in some cases the "fact indicated" and the expression are one and the same, Ljung says (p.109): "I would prefer to say that, in the case of utterances like (194)and(456) ("I am angry" and "I am hot") there simply is no 'fact indicated' or proposition." In taking this stand, Ljung disregards the fact that an utterance is based on representations of words stored in the mind. Equating language with "pure expression" is reducing itto the state of uncodified gestures. Even an animal can express the idea "I am hot/angry" by a certain bodily behavior. As Guillaume points out, such an analysis means leaving language at a very primitive stage: (p. 89)

> Strangely, declaring the sentence to be the sole reality of language - and thus taking things at their final stage, at the consequence and not at the condition - is equivalent to returning to that long-lost period, at one remove from primitiveness, when language had to operate within the first glossogenic area (the only one then available) in order to represent and express. At that stage, there was a certain interference between the act of expression and the act of representation.

10 CONCLUSION

The fact that my analyses of seem/appear, as, and the progressive illustrate the mind's circuit from see to SEEtends strong support for Guillaume's operational view of language. The mind's circuit consists of two movements, a contractive movement from universal to singular and an expanding movement from singular to universalThese movements have for Guillaume a universal application for language in general and for individual linguistic phenomena. They can be illustrated like this:

Fig. 18

see seeing seeING SEE(ing)
2 1 2 1
see SEE

The first contractive movement corresponds with the formation of the image of "see Y" (see seeing), while the second expanding movement corresponds with the representation of -ing in the superimposed see2 . The poles, see and SEE, are what Guillaume calls "the full universe" and "the empty universe": "Thus as the mental origin of the word, we have a full universe containing the particular notion to be abstracted, and as the mental term of the word, an empty universe from which everything has been withdrawn." (p. 114) (My underlinings; UB). The acquisition of -ing by see1represents the abstraction of a particular notion. This is a discriminating movement, through which X2 is separated from X1, thus anticipating the transformation of be into BE. This discriminating movement is symbolized in English by appear , which as it were helps the mind to distinguish X2 and X1. This is evident from numerous examples with a "double" appearance, as for example:

(54) He assured me there's nothing further legally that the man's sponsors can do. It would appear that the case is virtually defunct.(Arthur Hailey)

Here, X2 is "nothing can be done(appears)", and X1 is the case (appears to be defunct). The mental term of the word is SEE,which arises through a categorizing movement that is symbolized by the representation of -ing, the transfer of -ing from see1 to see2, leaving the original full universe empty.

As plays a crucial role in this operation, and this can be expressed in the formula:

(55) As interiorizes be and SEE in order for BE to be exteriorized.

As we have seen, it is an externalized be (in "X appears to be Y"and "X is Ying") that is interiorized by means of as.

It will be obvious that this paper has a deeper implication than just offering a plausible analysis of the progressive in English.Let me quote the final passage in Guillaume (p. 165): "Once homo loquens came to exist as such in historical time these problems became unavoidable. And because it is necessary for him to know about them, he must solve them, and in order to solve them, give himself an image of the solution. This image is language".

Translated into my analysis, this means that man must know about the problem how see can be represented as SEE, and in order to acquire this knowledge, he must solve the problem, i.e. he must transfer-ing to see2.Thus, in order for him to be able to solve the problem he must be able to produce a sentence such as:

(4) Cates was seeming to ignore them as he walked about the store serving the few white customers. (Alex Haley)

Put somewhat differently, he must be able to produce the image of seem Y, i.e. the image of the solution. As we have seen, "mechanistic" linguistics is based on the assumption that language is simply the solution, as is reflected in the credo : "A word is the label of a belief or an opinion". This means that the very basis of language is left out of account. The inevitable conclusion is that, in order to direct its efforts to the proper object, linguistics must replace its prevalent "mechanistic" outlook by a holistic view.

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GRADIENCE IN ENGLISH GRAMMAR

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I. Introduction

One of the more interesting advances in recent work in the study of modern English grammar is an explicit description of the inherent gradience in grammatical categories. Grammatical categories, it seems, are not discrete entities. Rather, they grade off(in a "fuzzy" way) into related categories, cf. Halliday (1985) An Introduction to Functional Grammar, Matthews (1981) Syntax, and Quirk et al. (1985) A Comprehensive Grammar of the English Language. Most of the work on gradience has focused on syntactic gradience in grammatical forms, e.g., forms that exhibit syntactic properties of both nouns and verbs, adverb and adjective, or verb and adjective.

However, equally interesting are the syntactic gradients found in grammatical functions, e.g., the grammatical object that shares some of the syntactic features of the subject or object complement or the subject complement that shares some of the syntactic features of the adverbial. Gradience in grammatical function has often been dismissed as examples of "structural ambiguity." Yet such an easy label seems to suggest, incorrectly, that gradience in grammatical function is a binary choice: the ambiguous sentence can be analyzed into both structure A and structure B. Those analyses miss some important generalizations: cases of multiple analysis often represent only two of many discrete points on a gradient, and gradience in function is not independent of gradience elsewhere in English grammar. (The gradient can be demonstrated through several syntactic tests -- passive, coordination, interrogation, movement, and deletion.)

This paper begins by outlining several instances of gradience in grammatical function discussed in Quirk et al. (1985: 732-738) --sentences with obligatory adverbials, extent and measure phrases, "middle" verbs, and verbless clauses. After studying gradience in clause elements, one discovers an implicational relation between gradience in form-class and gradience in function: Gradience in grammatical function is possible because of the ambiguous nature of most English verbs. That is, verbs as a form-class either exist on a gradient or (as in some subclasses of verbs) embody a gradient in themselves. Thus, gradience in function implies gradience in form. Finally one can illustrate the relational implication between formal and functional gradience by examining sentences with the structure NP_1 V NP_2 to-V NP_3

(We expected Jim to win the race).

2. Obligatory Adverbials

Verb complementation like in good health in the sentence He is in good health can be analyzed as either obligatory adverbials or as subject complements (Cs). General tests of adverbials are their form, usually prepositional phrases; their mobility with a clause; and their optional, peripheral status as a clause element.

The adverbial in He is in good health satisfies only the formal criterion: it is a prepositional phrase. It fails, however, the other tests: it is not optional nor mobile. Subject complements are coreferential with the subject NP and follow linking verbs. The PP satisfies both criteria for Cs. Additionally coordination provides an additional test of the status of the PP since coordination is only possible between constituents of equal status, cf.

(1) He is young and in good health.

The subject complement young demonstrates a formal criterion for subject complement status: Cs's are usually adjectives or NPs. Therefore the sentence He is young and in good health demonstrates by coordination that in good health is a subject complement but by form that it does not satisfy all the criteria of subject complements.

Similar problems occur in object complements and with adverbs, cf.:

(2) He set me at ease.

(3) He set them aside.

PPs in sentences with this verb complementation type do not clearly satisfy completely the test of adverbial or subject complement. The form of this marginal construction suggests that it is an adverbial, but coordination possibilities suggest that it is a subject complement, cf.:

(4) He is $\underbrace{\text{young}}_{\text{Cs}}$ and $\underbrace{\text{in good health}}_{\text{Cs}}$.

(5)? He is $\underbrace{\text{in good health}}_{\text{Cs?/A?}}$ and $\underbrace{\text{at the movies}}_{\text{locative adverbial}}$.

3. Extent and Measure NPs

Sentences in which extent or measure NPs follow the verb are marginal between object and adverbial analysis, cf.:

(6) He ran a mile (extent).

(7) It cost me five dollars (measure).

Extent and measure NPs allow questioning using what, which serves as a test of their object status, cf.:

(8) What did he run?

(9) What did it cost?

However, both extent and measure NPs allow questioning with how far or how much, respectively arguing for their adverbial status, cf.:

(10) How far did he run?

(11) How much did it cost?

Furthermore, extent and measure NPs allow passive voice correspondence, an obvious test of object-hood, cf.:

(12) A mile was run.

Again, extent and measure NPs as constituents in verb complementation are marginal clause elements in that they can be analyzed either as adverbials or as objects.

4. "Middle" Verbs

Verbs like have, lack, fit, touch , reach, mean, possess, suit, become, and equal are problems in that the following constituents seem to satisfy the tests for both object and subject complement functions. (Because those verbs consistently disallow any passive voice correspondences, they are often called "middle" verbs.)

These relational verbs are followed by constituents that are indeterminate between direct objects and subject complements.

(13) The French word 'maison' means 'house' in English.

(14) They have a small house.

(15) John lacks confidence.

(16) This coat doesn't fit me.

(17) One plus one equals two.

(18) This dress becomes you.

These verbs seem to require grammatical objects because they use object case pronouns (e.g., me in (16)), yet these verbs lack a passive voice counterpart, cf. (19) to (24).

(19) *'House' in English is meant by the French word 'maison'.

(20) *A small house is had by them.

(21) *Confidence is lacked by John.

(22) *I am not fit by this coat.

(23) *Two is equaled by one plus one.

(24) *You are become by this dress.

In one analysis, those verbs are transitive in that they do require objects (at least objective case pronouns). In a second analysis, those verbs are more like linking verbs followed by a subject complement. Notice that the constituent following the verb is coreferential with the subject for some of these relational verbs, particularly equals in (17). Notice also that linking verbs, like be, can substitute for some of the "middle" verbs, cf. (25) to (28) below.

(25) The French word 'maison' is 'house' in English.

(26) Jack is not confident.

(27) One plus one is two.

(28) This dress is you.

Although you and This dress are not coreferential in (28), the linking verb be will substitute for the "middle" verb become with a similar meaning.

Quirk et al. (1985: 735-736) do not specify where on the gradient of verb forms the "middle" verbs fall, preferring instead to be noncommittal by using only general terminology. Yet facts like the coreferentiality of some subjects and verb complements and the substitution of some "middle" verbs with the linking verb be suggest that these relational verbs fall on a gradient between transitive and linking verbs, thereby occurring with sentence final constituents that are indeterminate between the functions of grammatical object and subject complement.

5. Verbless Clauses

Verbless clauses in verb complementation are often ambiguous between subject complement function and adverbial function. At one end of this gradient the verbless clause is optional and peripherial, occurring with an intonation break, cf.:

(29) He left me waiting, anxious for a reply.

This argues for an adverbial analysis since many adverbial elements are optional, peripherial clause elements, occurring in separate tone units from the rest of their clauses.

Next on the gradient are verbless clauses which are incorporated into the tone unit of the clause, cf.:

(30) He left me nervous.

Nervous is optional (He left me) and thus peripheral in the clause structure, arguing for an adverbial analysis. However, some object complement qualities now appear. That is, the relationship between the object me and the verbless clause nervous is intensive (He is nervous) the two phrases are coreferential, and these facts argue for an object complement analysis.

Finally, some verbs completely disallow the adverbial status of the verbless clause, preferring instead to integrate the clause as an element of verb complementation, cf.:

(31) He seemed upset.

Here upset functions only as a subject complement, completely devoid of any adverbial qualities. Verbs that are collocationally restricted are the best examples of this end of the gradient, e.g., The sun shone bright.

6. The Relational Implication Between Formal and Functional Gradience

Notice two facts which seem central in this discussion of syntactic gradience. First, multiple analysis of clausal constituents and gradience in verb complementation are possible because of the ambiguous nature of most English verbs. Most verbs serve in a variety of syntactic and semantic categories. Linking verbs can also be intransitive and vice versa. Monotransitive verbs are often also complex transitive. Secondly, verbs themselves exist on gradients from auxiliaries to marginal modals, to semi-auxiliaries, to catenative, and finally to full lexical verbs, cf. Quirk et al. (1985: 1152f). So it seems that gradience in grammatical functions implies, and relies on, gradience in grammatical forms.

An excellent example of that implicational relation is found in sentences with the form NP_1 V NP_2 to-V NP_3. Those sentences fall on a gradient between monotransitive constructions and ditransitive constructions, with complex transitive constructions as the intermediate ground, cf.:

(32) We like parents to visit the school. (monotransitive)

(33) We expected Jim to win the race. (complex transitive)

(34) We asked the students to attend the lecture. (ditransitive)

First, notice that substitution of something for NP_2 to-V NP_3 structure divides the three sentences into two groups; (32) retains its meaning while (33) and (34) change their meanings, cf.:

(35) We like something.

(36) We expect something. (different meaning from (33))

(37) We asked something. (different meaning from (34))

Likewise, passive demonstrates that the NP_2 to-V NP_3 constituent is indivisible in (32) while the passive of (33) and (34) are acceptable, cf.:

(38) *Parents are liked to visit the school.

(39) Jim is expected to win the race.

(40) The students were asked to attend the lecture.

So substitution and passive tests demonstrate that NP_2 to-V NP_3 is a single constituent following a monotransitive verb. Furthermore these tests demonstrate that NP_2 is one constituent and to-V NP_3 is another constituent in sentences (33) and (34). The passive test allows an object function interpretation of NP_2 but the functions of to-V NP_3 are not yet determined.

Therefore, consider substitution of something for to-V NP_3 in sentences (33) and (34), cf.:

(41) *We like the parents something.

(42) *We expected Jim something.

(43) We asked the students something.

Also, consider what questions focusing on to-V NP_3 cf.:

(44) *What did we like the parents?

(45) *What did we expect Jim?

(46) What did we ask the students?

These tests argue for the nominal function of to-V NP_3 in sentence (34). Thus the verb in sentence (34) is ditransitive, and the to-V NP_3 constituent is an object, a direct object. Notice that the object function of to-V NP_3 in (34) is supported further by the facts that it can be the focus of a pseudo-cleft sentence and can be the response of a wh-question, cf.:

(47) *What we like the parents was to visit the school.

(48) *What we expected Jim is to win the race.

(49) What we asked the students was to attend the lecture.

(50) *What did we like the parents? To visit the school.

(51) *What did we expect Jim? To win the race.

(52) What did we ask the students? To attend the lecture.

Finally the constituent to-V NP_3 in sentence (33) seems to function as an object complement, suggesting a complex transitive structure, cf.:

(53) Jim is to win the race.

However, here lies another complication: all of the sentences demonstrate this intensive relationship between NP_2 and to-V NP_3.

(54) Parents are to visit the school.

(55) The students are to attend the lecture.

So what argues for monotransitive analysis of (32) and a ditransitive analysis of (34)? Primarily, it is the substitution of something, as above, that argues for the nominal character of NP_2 to-V NP_3 in (32) and the nominal character of both NP_2 and to-V NP_3 in (34). It is on this basis that the decisions about the exact transitive nature of each sentence is made, although each sentence is an example of multiple analysis on a gradient.

7. Conclusion

Gradience in grammatical functions implies, and is a result of, gradience in grammatical forms. All of the examples of gradience in grammatical function examined above have their genesis in the gradient nature of English verbs. One can illustrate the verbal gradient by exploiting four tests, two tests for grammatical objects (Tests 1 and 2 below) and two tests for subject complements (Tests 3 and 4 below). Naturally, objects satisfy tests 1 and 2 but not 3 or 4. Subject complements, which follow linking verbs as in John is hungry, fail tests 1 and 2 but satisfy tests 3 and 4. Adverbials, as expected, fail all of these tests for the grammatical functions of object and subject complement.

Verbal Gradient	X	X	X	X	X
Verb Class	Transitive	"Middle"	Linking	Verbs of the type leave	Intransitive
Verb Complement	O	O/Cs	Cs	Cs/A	A
Tests 1	+	+	-	-	-
2	+	-	-	-	-
3	-	+-	+	+-	-
4	-	+-	+	+-	-

Key to tests:

1. The verb allows or does not allow a verb complement in the objective case.
2. The verb allows or does not allow a passive voice correspondence.
3. The verb complement is or is not coreferential with the subject.
4. The verb complement is or is not in a copular relation with the subject.

The "middle" verbs and verbs of the type leave are marginal in that the verbs satisfy (to greater or lesser degrees for individual verbs) tests for both of the verb categories bordering them. Their marginal nature is illustrated above by the '±' symbol and the double grammatical function abbreviations, 'O/Cs' symbolizing the fusion of object and subject complement functions and 'Cs/A' symbolizing the fusion of the subject complement and adverbial functions.

The examples of gradience in grammatical function examined above exist because of the gradient nature of one particular form-class, verbs. As verbs fall on a gradient from transitive to linking to intransitive verbs, one finds verb complements that fall on a gradient from grammatical object to subject complement to adverbial. And as one would expect, for the verbs that are indeterminate between transitive and linking verb categories, one finds marginal cases of transitive verbs and marginal cases of linking verbs--the "middle" verbs discussed above. Some of those "middle" verbs, like have or fit, are closer to transitive verbs in that they seem to co-occur with objects. Others, like equal, mean, or become, are closer to linking verbs in that their verb complements behave syntactically and semantically as subject complements.

Similarly, one would expect marginal verbs falling on the gradient between linking and intransitive verb categories. And again one finds those marginal cases in verbs like leave and seem, for which some of the verb complements share the properties of subject complements and others share properties associated with the grammatical function of adverbial.

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ISSUES IN CHOCTAW SYNTAX: (RELATIONAL GRAMMAR)-1 VS. (RELATIONAL GRAMMAR)-2

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In the last decade, a number of works have appeared describing various aspects of the syntax of Choctaw, a Western Muskogean language of the United States. In particular, Davies (1984a, 1984b, 1986) cites data from Choctaw to argue in favor of RELATIONAL GRAMMAR (RG-1) (Perlmutter and Postal 1983, Perlmutter and Rosen 1984).

The present study examines some of the same data from the perspective of a RELATIONAL (NETWORK) GRAMMAR (RG-2) of a somewhat different lineage (Lockwood 1972, Sampson 1980). The conclusions reached imply that RG-1 is indeed correct in proposing a multi-level analysis of the Choctaw data, but errs in supposing that these levels are necessarily all syntactic, defined in surface grammatical terms such as SUBJECT and OBJECT (in RG-1: 1 and 2, respectively).

The examples in Figure 1 illustrate some points of Choctaw verb agreement and its (preliminary) treatment within the framework of RG-1. For some predicates, among them **ia** 'go,' the subject is expressed through a **nominal (NOM)** affix, whereas for other predicates, such as **hohchafo** 'be hungry,' it is expressed through an **accusative (ACC)** affix. Constructions such as (1a) are termed **UNERGATIVE**, since the initial stratum contains a subject (1) and a predicate (P), but no object (2). By the same reasoning, (1b) is **UNACCUSATIVE**, since it initially has an object (2) and a predicate (P), but no subject (1). <1> Finally, (c) illustrates the occurrence of both a subject and an object with the transitive predicate **pisa** 'see.'

A descriptively adequate grammar of Choctaw must exclude utterances such as (2) and (3), since these violate the valence properties (or case frames) of the predicates **ia** 'go' and **hohchafo** 'be hungry.' <2>

(2) * chi-ia-li-tok
2ACC-go-1NOM-PAST
'I go you.'

(3) * Hattak-at sa-hohchafo-tok
man-SUBJ 1ACC-hungry-PAST
'The man was hungry me.'

It is possible to account for the facts above by categorizing various predicates according to their agreement and role co-occurrence restrictions. Thus with respect to the types of predicates cited so far, the following is sufficient:

Class I: ia 'go,' bali:li 'run,' etc. / NOM
Class II: hohchafo 'sweat,' laksha 'sweat,' etc. / ACC
Class III: pisa 'see,' lhioli 'chase,' etc. / NOM ACC

Figure 1: Some simple expressions illustrating different agreement patterns.

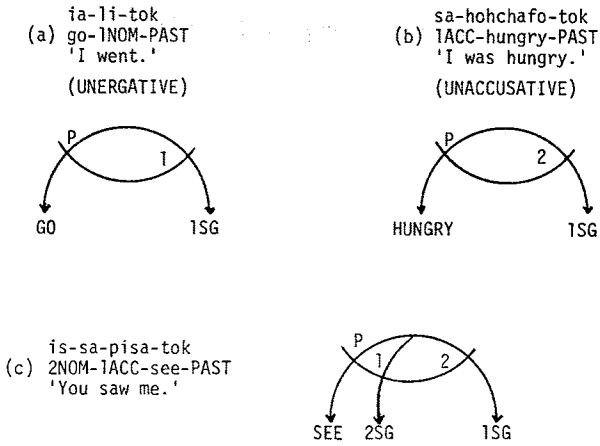
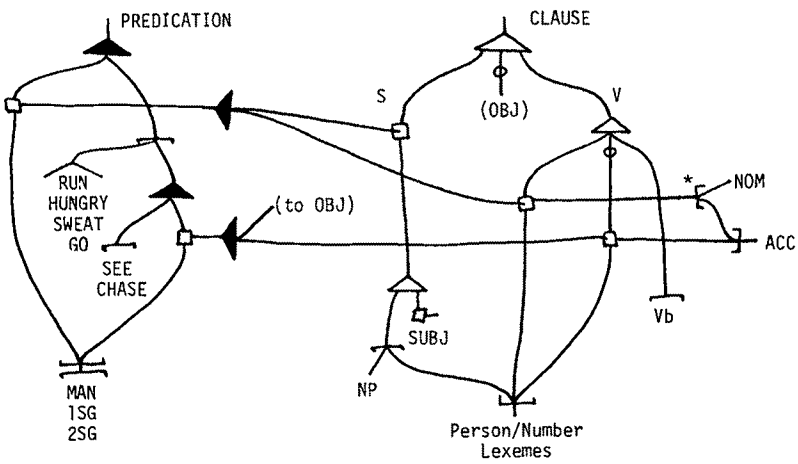


Figure 2: A schematic semo-lexological approach to Choctaw agreement and role co-occurrence restrictions.



Information concerning valence classes, roles, and so forth (cf. case frames) would typically be included in an RG-2 semology, but Davies (1986: 183) specifically rejects the use of lexical classes to specify case frames for Choctaw verbs, stating that

> **a verb-class analysis fails to provide a unified account of Choctaw verb agreement. Presumably, the gain would be that we would then not be obliged to posit multiple levels of GRs [grammatical relations--meb]...**

He does not, however, indicate how the deviance of (2) and (3) is to be accounted for within the framework of RG-1. Rosen's (1984) discussion of semantic roles and grammatical relations is beside the point, since she does not discuss co-occurrence restrictions between predicates and their associated semantic roles or grammatical relations. Since such restrictions do exist and are dealt with in an RG-2 semology, RG-2 achieves a higher level of descriptive adequacy than RG-1 in this respect.

It is also possible to argue that RG-2 is superior to RG-1 with respect to the former's treatment of surface syntax. In RG-1, surface syntax is widely held to be dealt with by means of a "surface structure template", a language-specific device which orders clause and sentence constituents. The problem is that there are few (if any) discussions of the form and functioning of this template. Frantz (1985) discusses the ordering of morphemes within the verb, but not of morphemes or words within clauses. The index of a bibliography covering works in RG-1 written through April 1983 (Dubinski and Rosen 1983) contains only one reference to "surface structure filters" (= templates?).

Although it can be argued that in RG-1 "syntactic" structure (at whatever stratum) is essentially non-linear, rules referring to grammatical relations rather than linear order, there are indications that surface order must at some point be addressed. With respect to Choctaw, for example, Davies makes such statements as **"Dative agreement determined by non-initial 3's precedes [linearly--meb] that determined by initial 3's,"** (1986: 45) and **"...the order of agreement markers is: ACC chômeur--Dative--ACC final term"** (1986: 96). At no point does he go on to describe the surface syntactic patterns of constituents larger than morphemes. It may be that for practitioners of RG-1, such issues are simply irrelevant or "uninteresting." If so, however, why does Davies attempt to deal with them at all? <3>

This lack of concern with the linear order of surface constituents is perhaps behind the practice of treating 'pro-drop' languages as if they are just that. <4> In Choctaw, for example, independent subject pronouns are the exception rather than the rule (Davies 1984: 372, n. 15; Nicklas 1979: 27). Cf. (4) and (5), the emphasized versions of (1a) and (1b):

(4) ana-t-o ia-li-tok
1SG-SUBJ-EMPH go-1NOM-PAST
'I went.'

(5) ana-t-o sa-hohchafo-tok
1ST-SUBJ-EMPH 1ACC-hungry-PAST
'I was hungry.

In (5) we have the justification for "promoting" the **initial** 2 of (1b) to a **final 1**, since in Davies's analysis, only **1's** can determine the subject marker **-t-**. Note that in RG-1 agreement rules are not part of the stratal diagram **per se**, but are instead found in semi-formal statements appended to such diagrams (cf. Davies 1986: 174-191, for example). <5>

The glitch in this approach is that utterances such as (4) and (5) are marked in Choctaw, the versions in (1a) and (1b)--without independent subject pronouns--being much more common. Davies uses underlying pronouns to trigger agreement, subsequently deleting them except in certain discourse environments (with emphasis, contrast, etc.). This approach has the unpalatable effect of deriving the unmarked surface forms (1a) and (1b) from the marked underlying forms (4) and (5).

Although space limitations prohibit a detailed treatment, a sketch of a possible RG-2 approach to some of the Choctaw data is provided below. Let us begin with Figure 2, which addresses several interrelated issues.

First, the semotactic construction **PREDICATION** accounts for the fact that any member of the set **{MAN, 1SG, 2SG}** may occur as the sole argument of a member of the class of one-place predicates **{GO, RUN, HUNGRY, SWEAT}**. In addition, with a member of the set ' of two-place predicates **{SEE, CHASE}**, both arguments are drawn from the set **{MAN, 1SG, 2SG}**. <6> This portion of the figure deals with co-occurrence restrictions which are often dealt with under the rubric **valence** or **case frame.**

The **DIAMOND** node labeled **AGT** (for '**agent**') could conceivably be called the '**initial 1**' when it occurs with a two-place predicate and the latter's accompanying argument; so, too, could it be called the '**initial 2**' when occurring with a one-place predicate. Similarly, it might be labeled '**deep** or **logical subject**' or '**experiencer**' depending on one's penchant for nomenclature. Since in RG-2 the emphasis is on relationships rather than names, however, debate over labels is mere quibbling.

The node **AGT** also serves as the RG-2 analog of the Stratal Uniqueness Law (only one **1** per stratum), since it ensures that each predicate will have only one argument related to the subject position of the clause (cf. the lexotactic portion of the figure). Notice that the RG-2 semotactics provides a unified' treatment of the Choctaw data since one-place and two-place predicates are both related to the same structure (that involving the node **AGT** and what is beneath it). The RG-1 approach, on the other hand, treats these two predicate classes as separate types of constructions, **UNERGATIVE** and **UNACCUSATIVE**, respectively (cf.

Figure 1). To conclude the discussion of Figure 2, it suffices to say that the node **PAT** (for '**patient**') corresponds to the '**initial 2**' of Davies's RG-1 description of two-place predicates (cf. (1b)).

The RG-2 approach can be extended to deal with doublets such as (1a) : (4) and (1b) : (5) by allowing the optional occurrence of '**emphasis**' (**EMPH**) with the argument associated with **AGT**. Figure 3 illustrates this in two RG-2 notational formats, algebraic and network. <7> Figure 4 illustrates the realization of the sememe **AGT**; it relates to the clause in two ways. First, it is always realized as subject marking on the verb (**SVb**), and second--in conjunction with emphasis--it may also be realized as an independent pronoun with the subject marker **-t-** in the (generally) clause-initial subject position (**S**).

Figure 5 shows the surface syntax that will accommodate the realizational relationships discussed above. The optionality element (the small circle) under the **DIAMOND** node indicating subject position (S) shows that this position need not be filled. The **AND** node further down on the same line shows that if there is an overt subject, whether a NP or an independent pronoun, it receives the subject marker **-t-** (labeled **SUBJ** in the diagram). Furthermore, person/number lexemes (pronouns) can occur in subject position only if accompanied by **EMPH**, in which case they are marked with **-o** (cf. (4) and (5) above).

With respect to the verb, **AGT** is realized as **SVb**, which relates to both person/number lexemes and to either the nominative (**NOM**) or accusative (**ACC**) affix, as determined by its accompanying verb. <8> As a final comment on the figure, the **CONCORD ELEMENT** (the shaded semicircular node below the person/number lexeme **1SG**) allows such lexemes to be realized more than once, as when **1SG** is realized as both an independent pronoun **ana** and as the verb suffix **-li**.

With respect to verb agreement and subject pronouns, the RG-2 analysis avoids the drawbacks inherent in the 'pro-drop' approach, as discussed above. First, the RG-2 treatment is more straightforward in that it treats participant coding on the verb as a **direct** rather than indirect relation; that is, the semological person/number characteristics of the agent (for example) are realized directly on the verb, rather than conditioning 'verb agreement' from elsewhere in the clause before being deleted. <9>

Second, the direct coding of participants on the verb avoids the necessity of deriving unmarked sentences from marked versions with independent pronouns. In the RG-2 approach, marked and unmarked versions are 'generated' separately, but still relate to a common semological core, differing only in the presence or absence of **EMPH**.

As a final source of potential superiority of RG-2 over RG-1, the former can serve as the basis of a performance model of language (Bennett and Hammond 1981, Dell and Reich 1980), whereas this issue is not (presently?) addressed in RG-1. It may be, however, that the issues of 'competence' and 'performance' are

Figure 3: Two semotactic descriptions of 1(a) and 4 and 1(b) and 5.

ALGEBRAIC: PREDICATION / (AGT·(1SG·[EMPH])) & (GO, HUNGRY)

NETWORK:

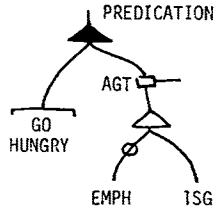


Figure 4: Two representations of the semo-lexemic (deep-to-surface) relations of AGT.

ALGEBRAIC: AGT / S & SVb

NETWORK:

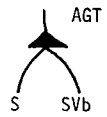
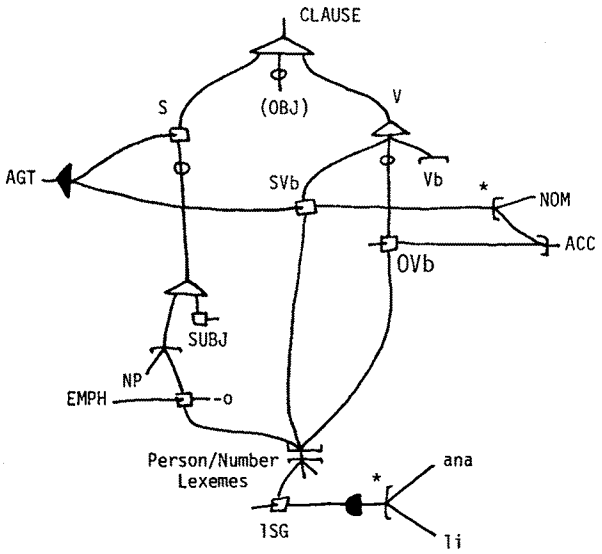


Figure 5: A more detailed illustration of the Choctaw clause.



outside its sphere of interest, although for many linguists, this in itself calls into question RG-1's endeavors and its appropriateness to the object of study.

To summarize the main points of this paper, it is maintained that the RG-2 analysis of the Choctaw data is superior to the RG-1 analysis in that the former accommodates the same data and putative "universals" as the latter (e.g., the "Stratal Uniqueness Law"), but does so in a manner which also (1) provides a role/deep case analysis of Choctaw predicational structure, (2) specifies the surface syntactic order of clause constituents, and (3) forms the basis of a performance model of encoding and decoding. None of these issues are currently addressed in any substantive way by RG-1.

Thus it is argued that "Number Two tries harder," and in this case, succeeds.

NOTES

1. The 2 is later "promoted" to 1 to account for subject marking on an independent subject NP; cf. discussion of sentence (5) below.

2. Readers are urged to season the phrase descriptively adequate' with several grains of salt; it is by no means an **a priori** (or innate?) concept, at least to me. An additional **caveat:** lacking access to Choctaw consultants, I have constructed what seem to me reasonable examples of co-occurrence violations, based on my knowledge of other languages. The additional Choctaw materials consulted (Jacob 1977, Nicklas 1979, Ulrich 1986) have borne me out, albeit only through negative evidence. If (1) and (2) are both grammatical and sensical, other examples could be concocted. At any rate, the arguments below do not hinge on any particular violation of case frame or valence relations.

3. My thanks go to Dr. Videa P. deGuzman for an enjoyable and informative discussion of this point. This should not imply that she agrees with my conclusions, however!

4. I find this hopelessly reminiscent of the linguistic imperialism rampant during the "English-only" heyday of early Transformational Theory. Some (well-meaning) colleagues have argued that the 'pro-drop' approach is "only a metaphor," but it seems to me that one either makes a claim with one's notation or one doesn't.

5. I find no discussion of constraints on the nature of such rules; neither do I find procedures for evaluating competing analyses of the same data.

6. The actual members of these sets are not confined to the examples listed here, of course.

7. This treatment is an abbreviated one, but its principles can be easily integrated into the semotactics of Figure 3. Note, however, that the discourse functions of **EMPH** and its occurrence in other semological environments are ignored here. A shorter exposition conveys the nature of the approach while conserving both space and the sanity of those not familiar with the RG-2 network notation.

8. The details of this conditioning are not shown, but occur at the **OR** node marked with an asterisk (*). Also, **PAT** relates to both the object position of the clause (**O**) and to the verb via the **DIAMOND** node indicating object marking (**OVb**); these relationships are not significantly different from those of **AGT**, so no further comment is provided.

9. Cf. the use by certain Post-Bloomfieldians (notably Bloch) of a "zero allomorph" of the English past tense suffix which then conditions the vowel alternations in **took/take, swim/swam,** etc. This analysis--designed to protect the Item-and-Arrangement (IA) model of language from the bogeyman of process--is an analog of the 'pro-drop' treatment of Choctaw criticized here. The strained reasoning and infelicities of the IA approach are discussed in Matthews 1972: 57-64 and Lockwood 1973. Readers are invited to consider the implications for syntax.

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INDIRECT OBJECTS IN SISWATI

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0. Introduction[1] One problem that remains unresolved in accounting for the grammatical relations in Bantu languages is determining the status of the two unmarked nominals, i.e. occurring without a preposition, following the verb in ditransitive constructions. Two proposals are in competition. On the one hand, Gary and Keenan's (1977) 'Two Objects Analysis' (TOA) for Kinyarwanda claims that the grammatical relations direct object (DO) and indirect object (IO) are collapsed into the single grammatical relation DO and that more than one NP in a clause can bear the DO relation to the verb. Since these two NPs both possess DO properties, they need not be distinguished. (Hodges, 1977; Kisseberth and Abasheikh, 1977; Kimenyi, 1980; Hyman and Duranti, 1982) On the other hand, it has been suggested and argued that the DO is distinct from the IO in these languages, although quite similar in their syntactic properties. (Dryer, 1983; Perlmutter and Postal, 1983; Frantz, 1984)

This paper, cast in Relational Grammar (RG), presents some arguments to support what Dryer calls the 'Indirect Object Analysis' (IOA). Evidence comes from SiSwati, a Bantu language spoken in Swaziland. It will be shown that a distinction between DO and IO needs to be maintained in order to make certain predictions of grammaticality. In so doing, the validity of the Stratal Uniqueness Law is upheld. The constructions involving two unmarked nominals that are considered here are: (a) active verbal ditransitive sentences, (b) causative sentences with a transitive complement clause, and (c) sentences with a benefactive, a locative or goal, or an instrumental nominal as one of the unmarked nominals. The last set of sentences are included because these oblique nominals manifest either an IO or a DO function when occurring as an unmarked nominal.

The object properties discussed by Hyman and Duranti (1982: 220-221), which according to them are asssumed by Bantuists, are as follows: (a) access to the position immediately following the verb; (b) capability of assuming the subject role through passivization; and (c) its expression as a clitic object marker within the verbal complex. The onus on the IOA position is to distinguish the two grammatical terms on the basis of these properties. Following the advancement rules and causative clause union rules that RG uses to explain revaluations of grammatical relations, we will point out some significant behaviour of the two terms in question.

1. Arguments for the Existence of IO in SiSwati. Three syntactic arguments to support the distinction between IOs and DOs are shown in: (a) word order, (b) object concord (OC) and passivization, and (c) OC and topicalization, relativization, and clefting.

1.1 Word Order. A common observation in Bantu languages is that when a verb allows two unmarked nominals to cooccur with it, the NP

corresponding to the recipient, traditionally labelled IO, comes before the NP that indicates the patient, which is associated with the DO. SiSwati is an SVO type of language and the order IO before DO is observed to an inviolable degree. For example.

(1) John u-nik-e sinini banana
SC-give-tns friend (SC = subject concord)
John gave a/the friend a banana.

If the order IO followed by DO is reversed, the interpretation continues to be that of the sequence recipient followed by patient, resulting in pragmatically unacceptable sentences. This linear precedence holds for causative constructions as well.

(2) make u-gez-is-e Tozi libhodo
mother SC-wash-caus-tns pot
Mother made Tozi wash the pot

Following the clause union analysis of causative constructions where the subject of the transitive complement clause, *Tozi* in this case, becomes the IO in the upstairs clause and the downstairs DO, *libhodo* 'pot', is upstairs DO, we find the same order of IO followed by DO applying in this type of causative construction . If we were to change *libhodo* with an animate noun, say, *inja* 'dog', and reverse the position of the two animate nouns, the only interpretation that can be associated with the sequence is *Mother made the dog wash Tozi*, which once more is pragmatically odd. This implies that the two unmarked NPs are distinguished positionally. The IO has a fixed position as far as its cooccurrence with the DO and the unmarked verb (for OC) is concerned.[2] The DO may register a corresponding OC marker or clitic in the verb, and when it does, the word order changes.

1.2 OC Marking and Passivization. In the literature cited, it has been observed that both unmarked NPs following the verb are capable of being expressed as a pronominal clitic or OC in the verb. While it is true that in Kinyarwanda both unmarked NPs may be indicated simultaneously in the verb, and thus show a strict ordering of DO followed by IO, this situation does not obtain in SiSwati. Unfortunately, the fact that only one OC marker at a time can be registered does not strengthen the argument for making a distinction between IO and DO. Moreover, the ability of either NPs to be expressed as a pronominal clitic seems to confirm the proposal that both nominals exhibit this particular property of true objects. For example:

(1.a) John u-*wu*-nik-e sinini (*banana*)
SC-OC-give-tns friend
John gave-it (banana) to a friend.

(1.b) John u-*si*-nik-e banana (*sinini*)
SC-OC-give-tns friend
John gave-him (friend) a banana.

Similar to the observation in Kimeru (Hodges, 1977.115), it will be noted that when an OC is registered in the verb, the referent NP object gets shunted to the

end of the predicate or is deleted. Despite the fact that the TOA may be said to account for the structure in (1.a) and (1.b), there is no compelling reason to reject the RG account for (1.b) as an instance of an initial IO or term 3 having advanced to DO or term 2 in final stratum, especially when it has relevant syntactic consequences which will become apparent subsequently. A general constraint proposed here states that only final 2 may optionally trigger an OC. Following this constraint, *sinini* 'friend' in (1.a) is initial and final 3 and *banana* is initial and final 2. In (1.b), however, via 3 to 2 advancement *sinini* is final 2, thus, it is allowed to be marked with its appropriate OC clitic -*si*- and *banana* is a final 2-chômeur. The same constraint may be seen as applying to the causative construction given in (2).

One other evidence used to support the TOA is the capability of either the DO or the IO to assume the subject relation through passsivization. The following passive sentences, indicated by the affix -*w*- in the verb, show each unmarked NP in question in (1) and (2) in the subject position:

(1.c) banana u-nik-w-e sinini ngu John
SC-give-pass-tns friend by
The banana was given to a friend by John.

(1.d) sinini si-nik-w-e banana ngu John
friend SC-give-pass-tns by
The friend was given a banana by John.

(2.c) libhodo li-gez-is-w-e Tozi ngu make
pot SC-wash-caus-pass-tns by mother
(Lit.) *The pot was made to be washed by Tozi by mother.*

(2.d) Tozi u-gez-is-w-e libhodo ngu make
SC-wash-caus-pass-tns pot by mother
Tozi was made to wash the pot by mother.

Much like the observation on OC, it may be said that the (c) and (d) sentences above make no distinction between a DO and an IO in their ability to passivize. However, within the RG framework, passivization may be accounted for via a 2 to 1 advancement, for (1.c) and (2.c), or via a 3 to 1 advancement, for (1.d) and (2.d). The significant distinction between the IO and the DO can now be shown in the corresponding OC-marked passive sentences:

(1.e) *banana u-*si*-nik-w-e ngu John (*sinini*)
SC-OC-give-pass-tns by friend
The banana was given-him (friend) by John.

(1.f) sinini si-*wu*-nik-w-e ngu John (*banana*)
friend SC-OC-give-pass-tns by
The friend was given-it (banana) by John.

(2.e) *libhodo li-*m*-gez-is-w-e ngu make (*Tozi*)
pot SC-OC-wash-caus-pass-tns by mother
The pot was caused to be washed-her (Tozi) by mother.

(2 f) Tozi u-*li*-gez-is-w-e ngu make (*libhodo*)
SC-OC-wash-caus-pass-tns by mother pot
Tozi was made to wash-it (pot) by mother

In (1 e) and (2 e), we have the typical case of 2 to 1 passivization, but with the additional OC marking corresponding to the other unmarked NP, our putative IO. Unlike (1 c) and (2 c) with the same type of passivization, (1 e) and (2 e) are ungrammatical. This is evidence to show that with a 2 to 1 advancement, the nominal *sinini* and *Tozi* are not legitimate 2s or DOs, at this level, thus, they cannot take OC. It is reasonable to claim that these nominals are 3s or IOs. In (1 f) and (2 f), the type of passivization exhibited here is identical to (1 d) and (2.d), where the supposed initial IO or 3 advances to 1. The striking difference is that the cooccurring initial 2, after 3 advances to 1, remains to be a 2, as evidenced by its ability to register an associated OC.[3] Thus, it is not enough to show that either unmarked nominal is capable of being expressed as the subject of the sentence to justify positing the same grammatical relation for both NPs. The more important and relevant structure that has been missed in previous accounts is the contrast between a final 2 and a final 3 in terms of their ability to take optional OC in both types of passive constructions.

1.3 OC and Topicalization, Relativization, and Clefting. Three other syntactic phenomena which attest to the same type of distinction between the two unmarked NPs are topicalization, relativization and clefting. Each process will be illustrated as it interacts with OC. Let us begin with topicalization. Given sentence (1), final 2 may be topicalized rendering:

(1.g) *banana* John u-(*wu*)-nik-e sinini
SC-(OC)-give-tns friend
The banana, John gave to a friend.

Compared with (1.b) where we claim that initial 3 advanced to 2, as evidenced by its ability to take OC, we cannot topicalize on *banana* because it has become a final 2-chômeur. Thus,

(1.h) *banana John u-*si*-nik-e (*sinini*)
The banana, John gave-him (friend).

On the other hand, topicalizing on *sinini* in (1.b) results in a grammatical sentence. If indeed the recipient nominal, *sinini* in (1) were also a DO just like the patient nominal *banana*, then topicalizing it without its corresponding OC should not render an ungrammatical form, yet, it does. Furthermore, if these two nominals were actually identical in grammatical function, the following construction, where the patient is marked with OC and the recipient is topicalized, should not be blocked:

(1.i) *sinini John u-*wu*-nik-e (*banana*)
The friend, John gave-it (banana) to.

Evidently, the TOA will need some constraints to prevent these ungrammatical sentences from being generated. The IOA, on the contrary, can account for them quite naturally by saying that the verb unmarked for OC cooccurs with the initial DO as final 2 and the initial IO as final 3. As a final 3, the IO does not

topicalize Similarly, in (1 i), *banana* marked with a corresponding OC is final 2, and *sinini* is not final 2 but final 3, hence, it cannot be topicalized. Having shown this difference in behaviour between the two nominals, we can claim that they start with different functions, one being a DO and the other an IO. These facts are further reinforced by applying topicalization in passive causative constructions. With a 3 to 1 passive, the cooccurring final 2 can be topicalized

(2 g) *libhodo* Tozi u-*li*-gez-is-w-e ngu make
pot SC-OC-wash-caus-pass-tns by mother
The pot, Tozi was made to wash-it by mother

In contrast, the putative IO which is final 3 in a 2 to 1 passive construction cannot be topicalized.

(2.h) *Tozi libhodo li-gez-is-w-e ngu make
Tozi, the pot was made to be washed by mother.

And, of course, neither can we topicalize the final 2-chômeur, when *Tozi* advances from an initial 3 to a final 2 in the active causative counterpart (Cf 1 h):

(2 i) *libhodo make u-*m*-gez-is-e *(Tozi)*
The pot, mother made-her wash (Tozi).

Thus far, we have shown topicalization as a good test for the inoperativeness of the 2-chômeur, and conversely its functioning on final 2 and not on final 3.

Turning to relativization, we will observe that it operates on final 2 as well. According to the accessibility hierarchy, if this is the case, then final 1s also relativize.[4] In contrast, final 3 and final 2-chômeur are banned from this process. For example:

(1.j) *banana* umuntfu la-*wu*-nik-e sinini u-lungile
man RM-OC-give-tns[5] friend SC-good
(Lit.) *The banana which the man gave-it to a friend was good.*

(1.k) *sinini umuntfu la-*wu*-nik-e *banana* si-lungile
The friend who the man gave-it a banana to is good.

Without the distinction between IO and DO, the difference between the grammaticality of the sentences above cannot be accounted for in a simple, natural way.

In cleft constructions, the two unmarked NPs behave in the same way as in relativized ones. Easily, final 2 as well as final 1 may be clefted but not a final 2-chômeur, as in the following:

(1.l) ngu *banana* la-*wu*-nik-e sinini John
It was a banana that John gave to a friend.

(1 m) *ngu banana la-*si*-nik-e John (*sinini*)
It was a banana that John gave-him (friend).

With a corresponding low tone on the clefted element below, the putative initial IO, *sinini*, is preferred to cooccur with the passive verb form (initial 3 to final 1) as follows.

(1.n) sinini le-si-nik-w-e banana ngu John
It was a friend that was given a banana by John

However, the following form, where *sinini* takes OC, i.e. with 3 to 2 advancement, is also acceptable but certainly not if it is a final 3.

(1.o) *sinini* la-*si*-nik-e banana John
It was a friend that John gave a banana to

(1 p) *sinini la-*wu*-nik-e John (*banana*)
It was a friend that John gave-it (banana) to.

Thus we have shown evidence that topicalization, relativization, and clefting may operate on a final 2 but not on a final 3 nor a final 2-chômeur

2. Oblique Advancements. Three other types of structure that may manifest two unmarked nominals following the verb have a Ben(efactive), a Loc(ative) or Goal, or an Ins(trumental) source cooccurring with a DO. They show that the IO and DO positions are potential slots for these oblique relations. The Ben nominal is identical with IOs and DOs in being unmarked; Loc, Goal and Ins nominals have the preposition markers *e- -eni, ku-* and *nge-*, respectively. In the subsequent sections, we determine the characteristics of each nominal in terms of functioning as an IO or a DO.

2.1 Ben Nominal. The Ben nominal is closely associated with the IO, not only in being unmarked, but also in occurring immediately after the verb. The formal difference between the two, however, is the presence of the affix *-e*ı in the verb whenever a Ben NP occurs. Compare (1) and (1 a) with the following:

(4) indvuna i-*ya*-kh-el-e bantfu (*ihhola*)
Chief SC-OC-build-ben-tns people hall
The Chief built a hall for the people.

Because of this difference, Frantz (1984) suggested that in Chi-Mwi:ni the registration of a similar benefactive affix in the verb denotes the advancement of the initial Ben to final 2. In SiSwati, I propose that, since the Ben behaves like an IO and its cooccurring DO is not a 2-chômeur until the former takes an OC, the Ben advances to term 3. As such, it manifests the properties of IOs discussed previously, namely, (a) advancement to 2, and thus takes OC and (b) advancement to 1 and still cooccurs with a final 2. Again, when initial 2 advances to 1, the Ben or as a final 3 cannot take OC.

The other tests for DO-hood may be applied to the initial-final 2 and the results will all be grammatical. Now, if we adopt the same 3 to 2 advancement

for the initial Ben, we get the following constructions showing topicalization, relativization, and clefting.

(4.a) Topicalize on Ben to 3 to 2[6]

bantfu indvuna i-*ba*-kh-el-e ihhola
people Chief SC-OC-build-ben-tns hall
The people, the Chief built-them a hall.

Note that where *ihhola* is initial-final 2 (may take OC -*ya*-), *bantfu* as a final 3 cannot be topicalized.

Relativizing on either a Ben to 3 to 1 or a Ben to 3 to 2 is acceptable, but not on a Ben to 3.

(4.b) ngi-bon-e *bantfu* indvuna le-*ba*-kh-el-e ihhola
I-see-tns people Chief RM+SC-OC-build-ben-tns hall
I saw the people that the Chief built a hall for.

To be able to undergo clefting, the initial Ben has to be either a final 1 or a final 2.

The absence of a structure without a Ben to 3 advancement creates some doubts as to the validity of an obligatory Ben to 3 rule. Moreover, the intermediate transition of the Ben to 3 appears to be superfluous. In fact, there is no evidence against a direct Ben to 1 or Ben to 2 advancement, except that as we will see in the next section, assuming the intermediate transition, Ben to 3, simplifies the account of the Ben and unifies it with the two other Oblique nominals--Loc. and Goal.

2.2 Loc/Goal Nominal. The two marked oblique nominals, exemplified below, are the Loc and the Goal. Both are similar to the Ben in their alternant structure in that they also take the position of the IO when cooccurring with a DO, with their preposition markers deleted.

(5) ngi-bhadal-e imali e-sikolw-eni
I-pay-tns money to-school
I paid money to the school.

(5.a) ngi-*(yi)*-bhadal-e sikolo *imali*
I-(OC)-pay-tns school money

(6) John u-tsembis-e umsebenti ku Bill
SC-promise-tns job to
I promised a job to Bill.

(6.a) John u-*(wu)*-tsembis-e Bill *umsebenti*
SC-(OC)-promise-tns job

(5.a) and (6.a) are thus two other instances of superficial ditransitive constructions with two unmarked nominals. RG accounts for these structures by applying the Loc/Goal to 3 advancement rule, where initial 2 remains as a

final 2 From this derived structure, all other structures discussed previously follow naturally. As final 2s (from a 3 to 2 advancement), the Loc/Goal takes OC. As with the previous final 3s, these two nominals may also passivize via the 3 to 1 advancement and, likewise, maintain the cooccurring initial-final 2. However, they differ from the Ben in being able to undergo topicalization as final Loc/Goal. Other than this, advanced Loc/Goal to 3 to 2 may also be relativized and clefted.

2.3 Ins Nominal. The Ins nominal is a curious grammatical relation. Unlike in Kinyarwanda and Chi-Mwi:ni, the typical Ins nominal in SiSwati appears only in the oblique form marked by the preposition *nge-*. However, for the purposes of this paper, we will consider the relevant type of Ins nominal found in SiSwati which shares some features of the typical Ins nominals in the two Bantu languages mentioned as exemplified below:

(7) ngi-gcobis-e umtimba nge-emafutsa
I-smear-tns body with-oil
I smeared the body with oil.

(7.a) ngi-*wu*-gcobis-e nge-emafutsa (*umtimba*)

Along with the above structures, we also find the Ins nominal unmarked:

(7.b) ngi-gcobis-e umtimba *emafutsa*
I-smear-tns body oil
I smeared oil on the body.

RG accounts for (7.b) as an instance of Ins to 2 advancement, supported by the alternant verb form containing the -*wa*- OC. One predictable consequence of this advancement is its possible input to passivization. With Ins to 2 to 1, the cooccurring initial 2 cannot take OC.

(7.c) emafutsa a-gcotjis-w-e umtimba ngi mi
oil SC-smear-pass-tns body by me
The oil was smeared on the body by me.

(7.d) *emafutsa a-*wu*-gcotjis-w-e ngi mi *(umtimba)*

This indicates that the initial DO in (7.c) and (7.d), *umtimba*, is not a final 2. By the Motivated Chômage Law, it should become a 2-chômeur when Ins advances to 2. However, this term continues to be accessible to passivization as in:

(7.e) umtimba u-*wa*-gcotjis-w-e ngi mi *(emafutsa)*
body SC-OC-smear-pass-tns by me oil
(Lit.) *The body was smeared-it (oil) by me.*

As has been suggested in previous works (Perlmutter and Postal, 1983; Frantz, 1984), initial 2 does not become a 2-chômeur in this case but that it retreats to 3. As a term 3, it can advance to 1, as shown previously. As (7.e) shows, final 2 (from Ins) is still a 2 as evidenced by -*wa*- OC. (7.c), therefore, may be accounted for by saying that initial 2 retreats to 3 when Ins advances to 2, and then in the final stratum, 2 advances to 1. This structure has no final 2 to trigger OC.

While the above rules appear to account adequately for the forms so far treated, we have further the uncanny situation in which the initial 2, after the Ins advances to 2, continues to behave like a final 2 in terms of allowing OC registration:

(7.f) ngi-*wu*-gcobis-e emafutsa *(umtimba)*

Compared with (7.a), (7.f) seems to have frozen the inital 2 to a final 2, even after Ins to 2 advancement. Curiously enough, while it seems counter intuitive to take initial 2, which retreats to 3 when initial Ins advances to 2, back to final 2 via the available 3 to 2 advancement rule discussed earlier, this account appears not to violate any principle.[7] To test this questionable term, (7.g) below shows that topicalizing, relativizing and clefting on this final 2 are all acceptable, but applying them on the final 2-chômeur (from Ins to 2) is not allowable.

(7.g) on final 2

(i) umtimba ngi-wu-gcobis-e emafutsa
(ii) umtimba le-ngi-wu-gcobis-e emafutsa womile
(iii) ngumtimba John la-wu-gcobis-e emafutsa

Given (7.g), the yo-yo rules 2 to 3 retreat followed by 3 to 2 advancement will be taken as correct tentatively until further investigation.

Similar to Loc/Goal, Ins may also be topicalized when it is a final Ins or a final 2. Likewise, as a final 2, it may also undergo relativization and clefting.

3. Summary and Conclusion. In support of the IOA, SiSwati has been shown to employ the following revaluation rules in RG: (a) 2 to 1, 3 to 1, Ben/Loc/Goal to 3, Ins to 2, and 3 to 2 advancements, and (b) 2 to 3 retreat. Moreover, the syntactic phenomena investigated operate as follows: (a) OC registration with final 2; (b) Topicalize on final 2 (and on marked non-terms); (c) Relativize and cleft on final nuclear terms. Evidently, the grammar of SiSwati regards nuclear terms very highly to the extent that it provides specific rules whereby other nominals can also optionally function as nuclear terms. However, when two or more nominals appear to exhibit the same grammatical function, the grammar need not recognize one and the same relation for the cooccurring nominals in a clause at all levels of analysis. Positing an initial IO different from an initial DO not only simplifies the account for the above processes but also unifies the syntactic behaviour of the Ben/Loc/Goal with the former and the Ins with the latter. Furthermore, by maintaining a distinction between IO and DO based on the arguments presented, we are able to explain:

(i) the ungrammaticality of a final 3 taking OC when initial 2 advances to 1, and the grammaticality of a final 2 taking OC when initial or advanced 3 advances to 1; and

(ii) the ungrammaticality of final 3 taking OC where the cooccurring DO is topicalized, relativized, or clefted and, conversely, the ungrammaticality of final 2-chômeur taking OC where the putative 3 to final 2 is topicalized, relativized, or clefted.

At least for SiSwati, the above syntactic phenomena are better accounted for by the Indirect Object Analysis.

NOTES

[1]I would like to express much appreciation to Joyce Sukumane, an MA student in our Department, for providing the language data for analysis and for passing grammaticality judgment on other sentences in this paper. Also, I thank William O'Grady for his helpful questions and comments. For any errors in data and analysis, I remain responsible.

[2]It is significant to note that the putative IO function is not only aligned with 'recipients' but also with 'causees'.

[3]It may also be argued that the (d) and (f) sentences manifest 3 to 2 advancement and then 2 to 1 passive, resulting in a cooccurring 2-chômeur. Concommitantly, OC is taken by acting 2s, i.e. final 2 or final 2-chômeur. This line of argument, however, is withheld until further investigation.

[4]Since final 1 relation is not at issue here, no examples will be given to illustrate the process to stay within the space limitation.

[5]RM stands for relative marker.

[6]Henceforth, consider similar transitions as an abbreviation of two advancements, e.g. Ben to 3 and 3 to 2.

[7]An alternative way of accounting for this structure in which *umtimba* is an initial 3 and *emafutsa*, an initial 2 may be more plausible, but to discuss it here will take us far afield. Suffice it to say that the Stratal Uniqueness Law is still defensible even when 2 to 3 to 2 is banned.

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REALIS AND IRREALIS VERB MARKINGS IN MIDDLE WATUT OF PAPUA NEW GUINEA

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August 14, 1986

0. Abstract.

Some verbs in Middle Watut show changes in the first consonant of the root which, at first glance, appear to be arbitrary variations. Further study, however, reveals a correlation with realis/irrealis mode. Hooley states that Mapos Buang, a related language 60% cognate, has a subclass of verbs that change similarly when future tense is present. My paper will attempt to predict the use of the different forms of the main verb in the Middle Watut verb phrase. They seem to be distinct from that noted by Hooley.

1. Background.

Middle Watut is an Austronesian language of Papua New Guinea. It is a member of the Buang family of languages located 60 km. south of Lae in east-central Morobe Province. There are five principal villages where the people speak Middle Watut: Kapin I, Kapin II, Tayek, Garawa, and Sambio. Often in literature, the language has been referred to by the village name. I refer to the language as Middle Watut, since the villagers of Sambio told me their language was referred to as such (the villages border the middle stretch of the Watut River).[1]

This paper stems from a desire to understand why some 25% of the verbs in Middle Watut have two different initial consonants. For example, 'ye' and 'je' mean 'to eat', while 'lipek' and 'zipek' both mean 'to wash-up'. The verbs that change, change the initial consonant from a liquid, semi-vowel, or fircative to a stop or affricate of the same position. Others even drop the initial consonant, such

as 'daw' and 'aw' meaning 'to dance'.[2]

2. Introduction.

Middle Watut speakers are marking a certain class of verbs with predictable changes of the initial consonant. They seem to be indicating whether the action of a verb phrase has occurred (or is occurring) at the time of the speech act or not. The change agrees with the mode of the clause. Hopper and Thompson (1980:252) state that mode "refers to the distinction between 'realis' and 'irrealis' encoding of events. An action which either did not occur, or which is presented as occurring in a non-real (contigent) world, is obviously less effective than one whose occurrence is actually asserted as corresponding directly with a real event." In other words, events that haven't already been realized as an occurring fact, are marked in a special way as being irrealis. This realis/irrealis distinction is helpful to understanding what is happening in Middle Watut, since it corresponds to the changes occurring in Middle Watut verbs.

An action occurring or having occurred is a realized fact (realis). It is asserted to be true. A future or desired action is not yet realized as a factual event (irrealis). It is only weakly asserted to be true. The potential to become fact is there, but the realization is not. A negative word asserts that the action is definitely not realized at the time of the speech act. Middle Watut speakers seem to be marking the main verb as to the verifiability of the truth of that action; has it been realized or not? Bybee (1985:170) says that speakers will indicate commitment to the truth for an assertion. She says that, in general, irrealis markings seem to correspond with modes of subjunctive [contingent character of an action], dubitative [doubt], probable, potential [might exist or happen at some other time], conditional [if...then]. That seems to agree with Givón (1984:284), who states that "the irrealis-assertion...is weakly-asserted as possibly true." The modes that Middle Watut marks for irrealis are actions being possibly true, not definitely true. Realis modes are generally the unmarked case for modes of indicative, interrogative, etc. They are asserted to be strongly true.

3. Verb Phrase.

The Middle Watut verb phrase has a set order of constituents. The main verb always concludes the verb phrase. Initiating the verb phrase may be a desiderative (desire) proclitic verb: mbe- 'want, desire, like'.

1) Main
e tande He called.
he called

2) Des. Main
a be nel I want to tell.
I want tell

An optional negator: si 'not' may come next.

3) Des. Neg. Main
[3]g*el embe si ja They don't want to eat.
they want not eat

Next may be the tense word: na (future).

4) Fut Main
g*el na daw They will dance.
they will dance

Next, a motion verb may occur in the verb phrase: la 'go', log* 'go back', lam 'come', lom 'come back'.

5) Motion Main
a lam de I come to sit down.
I come sit

Immediately before the main verb an aspect morpheme may occur: ndi- (progressive proclitic), mi (habitual).

6) Asp Main
e ndi-yep He was sleeping.
he PROG-sleep

7) Asp Main
a mi de I often stayed.
I HAB stay

Any of these may optionally occur in a verb phrase. When more than one of these occur, they appear in the following order:

8) (Desid.) (Neg.) (Fut.) (Motion) (Aspect) Main

Optional person markers in agreement with the person of subject may occur at the beginning of the verb phrase. They are proclitic, and thus attach to the first word of the verb phrase. The first person proclitic is 'a-', second person is 'wa-', and third person is 'e-'.[4]

9) g*ei a-mi nembe We used to call...
we(excl) 1st-HAB call

10) u a-mbe-na We two want to go.
we(2) 1st-want-will.go

11) wa-mbe-na (You) want to go.
you.want-will.go

12) e-mbi daw (They) wanted to dance.
3rd-want dance

The future tense often contracts with a following motion verb, so that the following occurs:

13) na la --> na 'will go'
na lam --> nam 'will come'
na log* --> nog* 'will go back'
na lom --> nom 'will come back'

These forms are contracted words and not future forms of the motion verb as Hooley (1964) states for Mapos Buang. Both na and la may occur in the same verb phrase as separate words.

14)

	Fut	Motion	Asp	Main
g*a	na	la	mi	aw
we(excl.)	will	go	HAB	dance

'We will go frequently dance.

4.1 Realis/Irrealis.

Like Mapos Buang and other Austronesian languages (Lynch, 1975), Middle Watut has a subclass of verbs which show a change in the initial consonant of the verb when the future tense is added to the verb phrase.The verb aw 'to dance' shows the markings clearly.

15) g*el aw 'They danced.'
they dance

16) g*el nam daw 'They will come dance'
they will.come dance

However, in Middle Watut more than just the future tense changes the initial consonant of this subclass of verbs. The presence of the desiderative in the verb phrase will also cause the main verb to be marked irrealis, even when the tense is past.

17) embe daw They wanted to dance.
want dance

Finally, the negator word si 'not' and/or the imperative mode also triggers irrealis marking. However, I have insufficient evidence to determine conclusively which mode triggers it for Middle Watut.[5]

18) Tok eng.
Firstborn.son cry.
Eldest son is crying.

19) Tok, wa-si d-eng ti.
Firstborn.son, you-not IRR-cry one.
Eldest son, don't cry little one!

Notice that if only aspect markers and the motion verbs occur in a verb phrase the realis mode is used. They do not trigger the marking of irrealis on the main verbs. Compare examples 15 and 16 with the following example.

20) g*el lam ndi aw 'They came dancing.'
They came PROG dance

In fact, the presence of la 'go', lam 'come', log* 'go back', lom 'come back' in a verb phrase always blocks the marking of irrealis on the main verb.

21) g*a na mi b-ivek
we(excl) will HAB IRR-circle.around
'We will frequently circle around.'

22) g*a na la mi vivek
we(excl) will go HAB circle.around
'We will go frequently circling around.'

Even though 'na' (Future) is in the verb phrase, the motion verb 'la' blocks 'vivek' from becoming 'bivek'. Apparently, when there is no contraction of na and la, the motion verb acts as a block to marking the irrealis on the main verb. It is possible that the motion verb is acting like a main verb in this case. Main verbs may occur contiguously when referencing sequential events.

23) Main Main
Tok yip kandi.
Firstborn.son slept got.up
The firstborn son slept and got up.

It is interesting to note that, the units (desiderative, negative, future) which require a change on the main verb to mark irrealis, all occur first in the verb phrase (see example 1). They occur before the units (motion verb, aspect words) which do not cause irrealis marking.

4.2 Phonemic Change.

The phonemic change in form between realis and irrealis is predictable. It is a change from simple (for realis) to a more strictured phoneme of the same position (for irrealis).

Some changes are the same as in Mapos Buang (Hooley) for realis --> irrealis: v --> b, g* --> g.

24) vivek --> bivek 'go around'
g*ip --> gip 'sleep'

In Middle Watut, however, a realis /w/ will become a

/b/ in its irrealis form.

25) wo --> bo 'make, become'

Also in Middle Watut a vowel initial verb in realis modes, adds an initial /d/ in irrealis, d --> Ø. This is unlike Mapos Buang where an /l/ becomes a /d/ in irrealis.

26) aw --> daw 'dance'
eng --> deng 'cry'

Similarly, a y --> j (The /j/ could be considered a /dy/ sequence. In that case, the /d/ is again eliding.).

27) ye --> je 'see'
ya --> ja 'eat'

Middle Watut also changes an l --> z.

28) lipek --> zipek 'wash up'

5. Conclusion.

The data I have obtained for Middle Watut, show realis/irrealis distinctions on a subclass of main verbs. The future tense and unrealized modalities (desiderative and negative) are marked as irrealis. Irrealis is marked by increasing the stricture of the initial consonant of the subclass of main verbs. The irrealis marking of the main verbs occurs in verb phrases with potential (future, desiderative) and negative or imperative. This goes beyond just the future tense verb marking of Mapos Buang.[6]

6. For Further Research.

Givón (1984) states that irrealis always includes the future tense, and sometimes habitual [aspect] or modality. Habituality and other aspects do not seem to be included in Middle Watut irrealis/realis distinctions. Future tense and modality are included in the irrealis/realis distinction. Further research should be done for Middle Watut as to which modes are included under the irrealis marking. Nida (1949:168-169) lists other modes for which I have no data at this time: optative [hope], intentive [intend], dubitative [doubt], subjunctive [contigent characteristics such as tentativeness, vagueness, uncertainty], obligatory [obligated], permissive [permission granted].

Further morphological study in correlation with semantics may indicate a realis/irrealis relationship between other variations of words. Could 'bena' meaning 'will want, will desire', be the irrealis form for 'vena' meaning 'require, necessary, need'? Likewise, could realis/irrealis be marked on more thant just verbs? For

example, could 'jek' meaning 'if', possibly be the irrealis form of 'yik' meaning 'during'?

Both initial consonant variations correspond to the phonemic variations of realis --> irrealis (See Section 4.2). Both sets also seem to correspond semantically in a realized/unrealized relationship. In clauses with 'during', the action is being realized, while in clauses with 'if' the action is unrealized.

29)	during the dance	(asserted as fact)
	if they dance	(unrealized event)

'Want' or 'Desire' are unrealized actions. 'Necessary' or 'require' asserts the action to be realized as a fact.

30)	They require eyes to see.	(asserted as fact)
	They want food.	(unrealized event)

7. Notes.

[1] My data come from five visits to the village of Sambio in 1984 and 1985. Three stories spoken by Pastor Geyammec and his cousin were transcribed and translated into English by Jack Geyammec, a fluent English speaker of the village. I also have other data gathered during my stays there. Altogether, over 325 clauses were considered for this paper.

[2] Many thanks to Ilah Flemming for her encouragement in writing this paper and her good ideas in charting procedures to discover this phenomenon. Thanks also to Bill Merrifield, Eugene Loos, John Watters, and Ralph Haupers for their editorial insights.

[3] g* in Middle Watut is the voiced velar fricative.
v in Middle Watut is the voiced bilabial fricative.

[4] Lauck (1977) states that Patep, a related language to which Middle Watut is about 75% cognate, has four verbs that require person agreement prefixes on the main verb: ep 'sleep', a 'eat', e 'see', ib 'die'. At this point I don't have enough data to be certain, but I believe the same Middle Watut verbs also require the same person prefixes as Patep.

31) <u>Realis.</u>

g*-ip 1st-sleep	I slept.
w-ep 2nd-sleep	You slept.
y-ip 3rd-sleep	He slept.

32) Irrealis.

a-mbe-na	g-ip	I want to go to sleep.
1st-want-FUT	1st-sleep	
na	dy-ip	He will sleep.
FUT	3rd-sleep	

I do not have an attested form for second person irrealis 'sleep'.

[5] Conditional statements may also cause irrealis markings on the main verb, but again, I do not have enough evidence to determine conclusively that it is so.

[6] Neither Lauck nor Adams mentions verb morphology changes for Patep though they do have a potential word 'ob'.

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CLITICS IN A STRATIFICATIONAL MODEL OF LANGUAGE

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0. *Introduction.* The concept of clitic elements has long been known in traditional grammar, though the original terminology refers only to the subvarieties PROCLITICS and ENCLITICS. In these terms, the concept is discussed and applied in such classic works as Bloomfield 1933 and Gray 1939. The back-formation CLITIC was apparently first proposed by Nida (1946:155). Since that time discussions of clitics have generally disappeared from purely introductory linguistics texts, though they have often appeared in texts devoted particularly to morphology and/or syntax.[1]

During the past decade, a number of significant studies of clitics have appeared within the Chomskyan tradition. Whatever one's opinion of the model of language used in these studies, they can be seen as quite useful and informative on the whole, and they certainly make significant contributions to our overall knowledge of clitics. One thesis of the present paper, however, is that this topic can be approached more sensibly and fruitfully from a stratificational perspective. Further, some erroneous views in the recent literature need to be mentioned and contrasted with those which come forth in the approach adopted here.

The discussion here treats the following topics: (1) criteria for recognizing clitics, (2) the treatment of clitics in a stratificational model, and (3) the correction of erroneous views in the recent literature.

1. *Criteria for Clitic Status.* From a stratificational perspective, the most basic answer to the question of criteria for recognizing clitics involves testing alternative treatments using the simplicity metric associated with the theory to see whether a clitic or non-clitic treatment of a given phenomenon gives the most general overall account. This answer is based on the approach suggested in Lamb 1966 to questions of alternative views of constituent structure. In a discussion of various proposed principles for constituent analysis, Lamb notes that their 'validity ... does not rest upon their own inherent virtues' but rather on the fact that 'they are derivable from the simplicity principle' (1966:52).

Even with this guiding overall principle, however, it is still worthwhile to cite some specific examples as illustrations of the practical consequences it entails. Here three particular criteria covering a considerable range of examples are cited, though no claim is made that these exhaust the possibilities.

Perhaps the most frequent situation where the postulation of clitics seems to be justified involves a criterion which may be

termed SYNTACTIC SEPARABILITY.[2] This criterion applies, for example, to the English data on articles and prepositions cited in Table 1. The separability of articles is shown by the comparison of such items as *a-house* and *a-big house*. The separability of prepositions from determiners is indicated by such examples as *in-all the-big houses*, where *in* crucially attaches to *all* instead of to the article.

TABLE 1. *SOME DATA ILLUSTRATING CLITICS IN ENGLISH*

əháws	A HOUSE
ðəháws	THE HOUSE
ðəháwzəz	THE HOUSES
əvəháws	OF A HOUSE
əvðəháws	OF THE HOUSE
inháwzəz	IN HOUSES
inðəháwzəz	IN THE HOUSES
əbíg+háws	A BIG HOUSE
inbíg+háwzəz	IN BIG HOUSES
inðəbíg+háwzəz	IN THE BIG HOUSES
inɔ́l+ðəháwzəz	IN ALL THE HOUSES
inɔ́l+ðəbíg+háwzəz	IN ALL THE BIG HOUSES

A second useful criterion may be termed COMEMBERSHIP. This criterion applies in a situation where a particular structural-functional position can be seen as having some clitic manifestations along with other manifestations which are separate words or phrases. This criterion also applies to the English articles and prepositions treated under syntactic separability if we compare the articles to accented determiners such as *this* and *that* or more complex phrases like *my Uncle John's* in the same position, and if we further compare unaccented prepositions like *of* and *in* with accented ones like *under*, *behind*, and *above*. The more interesting applications of the comembership criterion, however, are those in which the separability criterion does not also apply. Consider, for example, the Malagasy material in Table 2. Here possession is indicated by placing after the noun either one of the clitic pronouns /ku/ MY or /ni/ HIS or a full accented noun phrase such as /nilèilǎi/ THE MAN or /nivèivávi/ THE WOMAN.

Still another criterion may be termed DIFFERENTIAL LINKAGE. This means that elements which are grammatically co-constituents with an element on one side are phonologically attached in the opposite direction. Such a situation is illustrated by the data from Kwakwala in the following example (from Levine 1980:241 via Klavans 1985:106):

nəp'ididə	gənanəmχa	gukʷsa	t'isəm	
THREW	ARTICLE_ CHILD	OBJECT HOUSE	OBLIQUE ROCK	

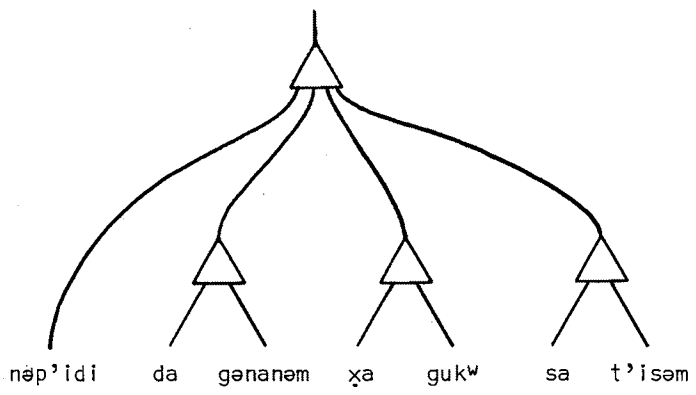
TABLE 2. *SOME DATA ILLUSTRATING CLITICS IN MALAGASY*[3]

ničánu	THE HOUSE	nibúki	THE BOOK
ničánuku	MY HOUSE	nibúkiku	MY BOOK
ničánuni	HIS HOUSE	nibúkini	HIS BOOK

ničánu+nilèilái	THE MAN'S HOUSE
nibúki+nilèilái	THE MAN'S BOOK
ničánu+nivèivávi	THE WOMAN'S HOUSE
nibúki+nivèivávi	THE WOMAN'S BOOK
nilèilái+nivèivávi	THE WOMAN'S MAN
nivèivávi+nilèilái	THE MAN'S WOMAN

In free translation, this example can be rendered as 'The child threw a rock at the house', but more literally it means 'The child threw-at the house with a rock'. Here the verb *nəp'idi* and all the nouns except the last one seem superficially to be suffixed, but the apparent suffixes relate to the following noun and specify a grammatical function related to its semological role and other considerations. The subject noun is specified as definite by *da* the *x̣a* after it indicates the object status of the next noun, and the *sa* indicates that the noun meaning ROCK is an oblique element, here in the role of instrument. The syntactic structure of this example is displayed in Figure 1. The syntactically preposed elements *da*, *x̣a*, and *sa* are then phonologically enclitic to the preceding element, and this gives the superficial appearance that the preceding words are inflected according to attributes of the following elements.

FIGURE 1. *THE SYNTACTIC CONSTITUENCY OF THE KWAKWALA EXAMPLE*



Some possible examples of such linkage in English are found in such examples as *I don't wanna do it* and *Do you hafta go?*, where the phonological words *wanna* and *hafta* contain enclitic variants of the marker *to*, which belong syntactically with the following

verbs. According to the materials in Klavans 1985, such linkage differences can occur in the other direction also.

2. *Clitics in a Stratificational Account.* The strata involved in a stratificational account of clitics, in terms of the basic model of Lockwood 1972, are the lexemic, morphemic, and phonemic.

The important point about the lexology of clitics is that it is not special to them: it requires no special devices not needed in the lexology of non-clitics, and it would not be possible to distinguish clitics from other words of a language on the basis of a lexemic description. One special syntactic property sometimes cited for clitics in some languages is a characteristic occurrence in the second position of a phrase or clause, enclitic to the preceding item. The Bulgarian material in Table 3 provides an example. Second-position syntax, however, is not confined to clitics, so it is not a unique feature of their syntactic occurrence. Verbs in declarative principal clauses in German provide a fairly familiar example of non-clitic element with second-position syntax. Another example is the conjunction *igitur* THEREFORE in some forms of Latin, including Ciceronian: it occurs in second position and functions in a manner similar to many clitics, but as a fully accented word it is by no means to be viewed as a clitic element. So the lexology will simply treat clitics as words like any others.

TABLE 3. *EXAMPLE OF POSTINITIAL ENCLITICS IN BULGARIAN*

kniga	A BOOK	pole	A FIEED
knigata	THE BOOK	poleto	THE FIELD
dobra kniga	A GOOD BOOK	dobro pole	A GOOD FIEED
dobrata kniga	THE GOOD BOOK	dobroto pole	THE GOOD FIELD
edna kniga	ONE BOOK	edno pole	ONE FIELD
ednata kniga	THE ONE BOOK	ednoto pole	THE ONE FIELD
edna dobra kniga	ONE GOOD BOOK	edno dobro pole	ONE GOOD FIELD
ednata dobra kniga	THE ONE GOOD BOOK	ednoto dobro pole	THE ONE GOOD FIELD

For the greater part of the morphology, clitics are also to be treated in the same manner as other words. In particular, it should be noted that clitics, like full words, may be either uninflected parti les or inflected words. The Bulgarian articles in the present data, for example, show evidence of gender inflection, and further examples showing inflection for number could also be given. There is, however, one portion of the morphology which sets clitics apart from ordinary words. According to the conception adopted here, at any rate, there will be a part of the morphology which is involved in supplying morphological boundaries before and after various kinds of words. Since the different behavior of clitics is what sets them apart from ordinary words, the phonology must have information available that it is dealing with a clitic rather than an ordinary word. In a stratificational model, the

most effective means of encoding such information is in the boundary elements assigned by the morphology.[4]

Apart from the word-internal boundaries needed in some languages and the generally required boundaries of intonation groups, at least three types of boundaries may be needed in dealing with full words and clitics of various types, though not all of these potential types will necessarily be used in a given language. Table 4 schematizes the boundary properties of four types of clitics and a contrasting full word. Here the basic word boundary is labeled /+/: it is typically realized as a phonological open transition setting off phonological words. Two special boundaries are used to set off varieties of LOOSE CLITICS, whereas the contrasting CLOSE CLITICS are defined as requiring no boundaries.[5]

TABLE 4. *PROPERTIES OF CLITICS AND CONTRASTING FULL WORDS*

TYPE	PRECEDED BY	FOLLOWED BY	SCHEMA
FULL WORD	/+/	/+/	+ XXXXX +
LOOSE PROCLITIC	/+/	/⇒/	+ XXXXX ⇒
CLOSE PROCLITIC	/+/	no boundary	+ XXXXX
CLOSE ENCLITIC	no boundary	/+/	XXXXX +
LOOSE PROCLITIC	/⇐/	/+/	⇐ XXXXX +

Figure 2 presents a highly generalized schema for the occurrence of various types of clitics in the same phonological word with a full word. The full word in the middle is shown to have the potential of being preceded by loose and close proclitics and followed by close and loose enclitics. There can potentially be more than one clitics of each type, and then each of the loose clitics would be followed by a boundary if proclitic and preceded by one if enclitic.

FIGURE 2. *SCHEMA FOR A FULL WORD SURROUNDED BY CLITICS*

+ XXXXX ⇒	XXXXX	XXXXX	XXXXX	⇐ XXXXX +
LOOSE PROCLITIC	*CLOSE PROCLITIC*	*FULL WORD*	*CLOSE ENCLITIC*	*LOOSE ENCLITIC*

Figure 3 presents a stratificational catalysis of a portion of morphotactics dealing with this kind of classification of words. It is designed to assign the correct boundaries in line with a classification of words proveded by the morphotactics. At the beginning of any word we get the /+/ boundary unless that word is enclitic: then the diagram specifies a zero boundary for a close enclitic, or a /⇐/ boundary for a loose enclitic. After any word we either terminate the intonation group by taking a terminal element, or we proceed to take another word by going around the loop at A. If the preceding word was a close proclitic, or if the next one is a close enclitic, then no boundary is produced as the realization of the abstract element ^{M}/B/. If that preceding word was a close proclitic, we get the /⇒/ boundary. Otherwise we get

either a /+/ or a /⇐/ under the same conditions as in the preceding case.

FIGURE 3. *MORPHOTACTICS FOR PLACEMENT OF BOUNDARIES*

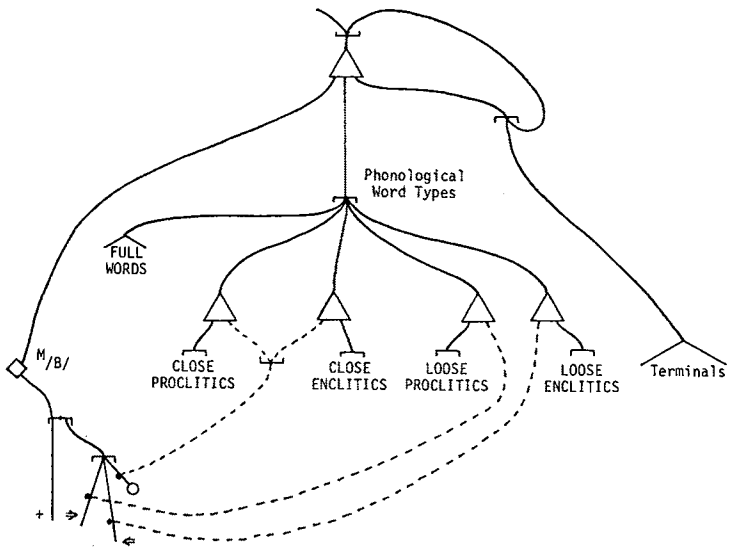


Figure 4 shows an application of this general schema to the facts of Polish, a language which has loose proclitics and enclitics (so defined because they stand outside the regular accent system of the language, which assigns accent to the penultimate or only syllable of the full word). Here overt clitic boundaries are shown, and the possibility of zero boundaries is not needed. In Table 5 some Polish examples illustrating the results of this system are given.[6]

3. *Comparison with Other Views.* This section discusses three questionable claims found in the recent literature on clitics, primarily Chomskyan in orientation. These claims are at least not valid across models, and they seem to violate common sense enough to make any model suspect if it requires one to maintain them.

The first such claim is the inclusion of clitics among the potential parts of speech in Schachter 1985. On the whole this survey is admirably well-organized and highly useful, and it has the further virtue of being stated in theory-neutral terms. The few paragraphs it devotes to clitics are even useful if one ignores their further context. In fact, this discussion tends to refute rather than support the author's suggestion that clitics form a part of speech, stating 'since the class of clitics is positionally defined, it may cut across parts-of-speech classes that are defined on a functional basis' (p.54). This statement and some of the examples which follow it tend to make the claim that clitics

FIGURE 4. *CLITICS AND FULL WORDS IN POLISH*

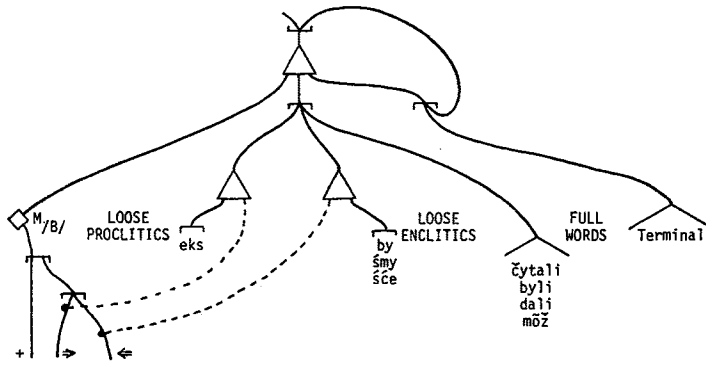


TABLE 5. *EXAMPLES OF POLISH (LOOSE) PROCLITICS AND ENCLITICS*

MORPHOPHONEMIC	PHONEMIC	G L O S S
eks⇒möž	eksmőš	EX-HUSBAND
čytali⇐śmy	čytáliśmy	WE READ (past)
byli⇐by⇐śmy	býlibyśmy	WE WOULD BE
dali⇐by	dáliby	THEY WOULD GIVE

form a separate part of speech a hollow one indeed. We do, of course, need to allow part-of-speech classes to overlap to deal with instances like English *fancy* (noun, verb, or adjective), but it is quite another thing to say that one particular item belongs to two different parts of speech simultaneously. This possibility is even at variance with the general picture of classification presented elsewhere in the article. Properly, then, any mention of clitics in this article should have denied their status as parts of speech.

A second dubious claim about clitics is found in the work of Judith Klavans, one of the principal writers in the recent literature on the subject. Her approach treats clitics as a special SYNTACTIC class characterized by special rules of 'movement' and 'attachment'. She has developed a fairly elaborate system for a set of facts that can be treated in a simpler way. We do not need special rules or equivalent principles for the placement of clitics if we treat them syntactically as ordinary words, as suggested in the present paper. Then we only need the special boundary characteristics developed above.[8]

Arnold Zwicky has been another important contributor to the recent literature on clitics. His 1977 paper was a pioneering

effort in the recent context. Then Zwicky and Pullum 1983 argued fairly convincingly that the historical English clitic *n't* (as in *can't*, *don't*, *won't*, etc.) should be interpreted as an inflectional element in the modern language. In Zwicky 1985, however, he tries to maintain that such items as the English prepositions, articles, and auxiliaries, though they commonly depend accentually on surrounding items, should not be treated as clitics. As syntactically independent but phonologically dependent items, these words fit right into the definition of clitics assumed in the present paper. Some examination of Zwicky's principal reasons for his conclusion is thus warranted.

One of the particular examples he cites is the infinitival *to* as in his example *to bravely go where no man has gone before*. In justification of this he first mentions that this *to* can sometimes bear an accent, as in *I don't want tó go*. This is not at all convincing as an argument, because it is common for words to be clitics under some circumstances and not in others, depending on various syntactic and stylistic factors.[9] Indeed Zwicky's earlier work (1977) provides for such a possibility as a common phenomenon.

His other principal argument is more interesting, and it turns on a point of general English allophonics. He argues that 'if *to* were a proclitic..., then we would expect no aspiration of the first /p/ in *to perpetuate*, since it would not begin a (phonological word.' (1985:292). As he states elsewhere, this argument is based on the assumption that 'one of the contexts for aspiration is the beginning of a phonological word' (ibid.). The other one is presumably at the beginning of an accented syllable.

In the face of this evidence, the best conclusion seems to be that the traditional statements defining the conditions for aspiration in English are simply a bit too narrow. When our discussion is centered on specifying aspiration for the phonological realizations of LEXICAL WORDS, the traditional formulation seems to be acceptable. But an alternative formulation is not contradicted by the facts, and it has the virtue of also governing phonological words which realize syntactic phrases, as in *to perpetuate* and *to the parade*. The alternate formulation is as follows:

> Voiceless stops are aspirated when they are syllable-initial and either in an accented syllable or in any syllable before the first accented syllable of a phonological word.

This reformulation handles the difficulty cited by Zwicky, and it does not appear to be possible to find a counterexample in the form of an unaspirated voiceless stop at the beginning of a pre-accent syllable. Lexical words in English always have some kind of accent by the second syllable at the latest, so sequences including proclitics would be the only way to produce a series of two or more unaccented syllables before the first accent.

4. *Conclusion*. It is argued here that clitics are best seen as grammatical words which are phonologically dependent in that they are treated more in the manner of affixes in the phonology. The facts of some languages require us to recognize a distinction between close clitics, which are phonologically like true affixes, and loose clitics, which occupy an intermediate position between

true affixes and separate words in their phonological behavior. It is further argued that clitics should not be seen as constituting a part of speech, that they have no special syntactic properties, and that they include unaccented words in general.

NOTES

1 Clitics are not mentioned in the indexes of such Neo-Bloomfieldian texts as Gleason 1955, Hockett 1958, and Hall 1964, nor in such Chomskyan-based texts as Langacker 1968, Fromkin & Rodman 1974, and Akmajian, Demers, & Harnish 1979. Clitics are treated, however, in Matthews 1974 and Elson & Pickett 1983.

2 This criterion is explicitly discussed in Elson & Pickett 1983 under the name SEPARABILITY (p. 142).

3 Thanks are due to Michael Eric Bennett for supplying the Malagasy data and for discussing its analysis.

4 This results from the fact that this model treats performance in terms of signals passing through a network and rejects any kind of derivation.

5 In Klavans 1983 close clitics are referred to as LEXICAL and loose clitics are termed POST-LEXICAL. A different terminology is required in the present context, since the type of stratificational model used here does not have a true lexicon in the Chomskyan sense. See the discussion in Sullivan 1977.

6 Comrie 1976 cites these examples but excludes them from the formal (Chomskyan) treatment offered in the article. A less complete treatment of some of this material is found in Lockwood 1979.

7 All clitics in a given language may, of course, belong to the same part of speech, and it may also happen that all members of a particular part of speech may be clitic in a given language. It is also well-known that members of certain classes, such as pronouns, determiners, adpositions, conjunctions, and auxiliaries, are much more likely to be clitics than others.

8 The title of Klavans 1979 seems to suggest her agreement with one of the basic theses of the present paper. In actuality, however, she treats only inflected clitics as words and considers the others to be 'phrasal affixes'.

9 It should be mentioned that Zwicky's discussion is set in the context of a whole series of tests for clitic status, most of them couched in a Chomskyan framework. Complete discussion of these tests is far beyond the scope of the present paper.

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CLITICS--TO BE OR NOT TO BE WORDS*

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Recent years have witnessed a renewed interest in the topic of clitics--in various languages and on the status of clitics in a general theory of language structure. Arnold Zwicky (1985:283) observes: "The recent flurry of work on clitics--especially the description of clitic systems in various languages and the examination of the status of clitics in a general theory of language structure--has made the task of distinguishing clitics from affixes, on the one hand, and independent words, on the other, an especially pressing piece of business for linguists."

Some writers seem to confuse the relationship between phonological and grammatical distribution. A clitic is obviously a cross between the two types of distribution--phonologically-attached to (or leaning on) a word to which it is not necessarily related grammatically. In recent articles, these relationships have been described with a variety of terms, e.g.:

Zwicky and Pullum (1983:503f) use the term HOST (or sometimes HOST WORD) vaguely but it seems to refer to the phonological host. Barbara Hollenbach (1984:304ff) applies the term unambiguously to the phonological (linear) attachment. Judith L. Klavans (1985:100) comments regarding this vagueness: "HOST WORD is defined in terms of linear adjacency to the clitics, but HOST PHRASE is a structural notion." and "To refer to the actual phonological attachment between a clitic and an adjacent word, I use the term LIAISON. Clitic positioning is a matter of the occurrence of a clitic in a particular syntactic or morphological structure, whereas clitic attachment is phonological."

Restating this special dual citizenship feature of clitics in the words of Joel A. Nevis (1985:289): "The clitic has a mixed status; it behaves in certain respects like a full word, in other respects like a true affix. One typically finds syntactic parallels between clitics and independent words, but phonological parallels between clitics and affixes."

The topic I would like to address here is the grammatical status of such "mixed status" forms. Zwicky 1985 has presented a series of arguments regarding the status of morphemes as affixes, clitics, particles, or independent words in universal grammar. His principle concern is opposition to the use of the term "particle." He states,"I shall argue here that there is no grammatically significant category of particles. . . There is no

reason to insert a particle level of grammatical units between the clitic and word levels in the hierarchy of units affix/clitic/word/phrase/clause" (1985:290). Zwicky's objection to the term is that particles are an "acategorial" group of forms which find no specific place in the grammar description. By his criteria, affixes and clitics are acategorial, and only (independent) words are categorial; hence particles should be assigned to one of these three groups of forms. However, his approach results in almost no clitics in the data from five languages presented. English has only one "special clitic"--the **'s** possessive marker. In addition it has certain "simple clitic variants"--the shortened forms of auxiliaries (e.g., **'d** for 'had/would', **'s** for 'is/has'). All other suspect items are either affixes (shortened form **n't** for 'not') or independent words (e.g., infinitival **to**, prepositions, verb 'particles', and discourse markers).

In attempting to apply Zwicky's (1985) various "tests" (or "symptoms" as he also calls them) to Isthmus Zapotec (an Otomanguean language of southern Mexico, hereafter IZ), I did not find clear evidence for classifying any of the clitic-like items as either clitics or words; however, they are all clearly <u>not</u> ordinary affixes. IZ has at least thirty such dubious forms. None meet all of Zwicky's tests for either clitic or word. Without taking time to describe each test and its results for each IZ item, the following facts are worth noting.

1. Test 2.33 "Construction" states the following: "Insofar as clitics are affix-like, we should expect that, if the distribution of an element is correctly stated in terms of its ability to combine with single words, it will be a clitic; and also that, if the distribution of an element is correctly stated in terms of its ability to combine with (potentially) multi-word phrases, it will be a full word" (1985:287). Perhaps he is confusing phonological and grammatical distribution here, for my understanding of the basic characteristic of clitics in contrast to affixes is precisely that clitics occur (grammatically) in constructions with multi-word phrases. Assuming he is referring to grammatical combinations, then all the IZ dubious items are "full words."

2. Zwicky's closing "metacriterion" (2.6) also classifies the IZ forms as words, for he states: "In the absence of clear evidence classifying an item one way or the other, we should assume that the item is a word (or an affix)."

3. On the other hand, by the tests labelled ORDERING (2.34), BINDING (2.31) and AN ACCENTUAL TEST (2.2), most are clitics. Actually, I prefer an analysis of these IZ items as words. However, I am not happy to label them INDEPENDENT WORDS, along with nouns and verbs.

The Otomanguean and Mayan language families of Mexico and many indigenous languages of South America all include forms which

are difficult to identify as clearly affixes or words and hence come somewhere in between. In the various languages, and by various analysts, these have been labelled CLITICS, DEPENDENT WORDS, or PARTICLES. They include a wide range of semantic categories, from pronominal subjects or objects to adverbial modifiers, or the so-called "mystery particles" (Longacre 1976), which show relations between time sequences or participants in a discourse.

I would like to illustrate the problems with some of the IZ dubious items, which for convenience I will temporarily label clitics.

IZ clitics occur in distributions at three levels of a unit (grammatical) hierarchy: sentence (in tagmemic terms, S' in TG terms), clause (S in TG terms), and phrase.

An example of the sentence-level clitic is the yes-no question marker **la** as in (1) and (2):

(1) **ma 'beeda=be=la**[1]
already came= 3h=Q
'Did s/he already come?'

(2) **'ma=la**
already=Q
'Already?'

Clause- and phrase-level clitics are best illustrated by the series of bound pronominal forms which function as subjects of clauses, as possessors of nouns, as parts of free pronouns, and with quantifiers.

SUBJECTS: IZ is a VSO language, and the subject constituent may be either a noun phrase OR a bound pronoun, as illustrated in (3) and (4):

(3) **sti= 'ǰi= ke bi'taagu 'leǯu 'gyonna 'gidi=ke**
other=day=that closed rabbit three skin= that
'The next day, the rabbit tied up those three skins'

(4) **sti= 'ǰi=ke bi'taagu=me 'gyonna 'gidi=ke**
other=day=that closed= 3a three skin= that
'The next day, s/he tied up those three skins'

The bound pronoun replaces the free noun phrase rather than occurring in agreement with it. This distribution may be considered a type of "replacement" feature (Zwicky 2.42).

In addition, the subject forms may be separated from the verb stem by various adverb-like forms (mostly also clitics):[2]

(5) **bi'taagu=si= me ka='gidi=ke, bi'ree gu'ǯooñe=me**
closed= only=3a PL=skin= that left running= 3a
'As soon as s/he tied up those skins, s/he left rapidly'

(6) **ka'yo= ru= be 'ro= 'šaata= be**
eating= still=3h eats=too much=3h
'S/he is still eating' s/he eats too much'

POSSESSORS: The bound pronominal morphemes (illustrated above with only third-person forms) occur also with nouns to indicate possessor. They may follow the noun directly or a noun-adjective phrase, as in (7) and (8):

(7) **'bič̌i= lu**
brother=2s
'your brother'

(8) **bič̌i 'wiini=lu**
brother small=2s
'your little brother'

AS PARTS OF FREE PRONOUNS: The bound pronouns occur also with pronominal words to form free pronouns.

Personal free pronouns are formed by the word **'laa** followed by a bound pronoun. They occur as objects or as fronted (topicalized or focused) subjects, as well as in isolation in responses:

(9) **gu'zi?=be 'laa=me**
bought=3h PERS=3a
'S/he (human) bought him (animal)'

(10) **'laa=be gu'zi?=be 'laa=me**
PERS=3h bought=3h PERS=3a
'It was s/he who bought him/her'

(11) (a) **tu gu'zi? 'laa=me**
who bought PERS=3h
'Who bought him/her?'

(b) **'laa=be**
PERS=3h
'S/he (did)'

Possessive free pronouns are formed with the word **'sti** followed by a bound pronoun:

(12) **'sti=lu** 'yours'
'sti=be 'his/hers'
'sti=du 'ours (exclusive)'

The possesive free pronouns occur as subjects (following the verb or fronted for topicalization or focus), as objects, as possessive adjectives, and in isolation:

(13) **'byaba 'sti=be**
fell POS=3h
'His/hers fell'

(14) **'sti=be nga 'byaba**
POS= 3h FOC fell
'It was his/hers that fell'

(15) **gu'zi?=be 'sti=du**
bought=3h POS= 1excl
'S/he bought ours'

(16) **gu'zi?=be la'yu 'sti=du**
bought=3h land POS=1excl
'S/he bought our land'

(17) (a) **tu 'sti 'ndi?**
who POS this
'Whose is this?'

(b) **'sti=du**
POS= 1excl
'(It's) ours'

Third person bound forms (and optionally first person plural inclusive) may be pluralized by a preposed bound form **ka**. The **ka** morpheme itself is a candidate for clitic-hood or word-hood. It pluralizes nouns, demonstrative pronouns and the bound person pronouns. With nouns, it substitutes for (free) number words rather than accompanying them:

(18) **ka='ba?du** (cf. **čupa 'ba?du** 'two children')
PL=child
'the children'

(19) **ka='ndi?** **ka='nga**
PL=this PL=that
'these' 'those'

(20) **'laa=ka=be** 'them'
PERS=PL=3h

(21) **'sti=ka=be** 'theirs'
POS= PL=3h

(22) **'sti=nu** or **'sti=ka=nu** 'ours'
POS= 1incl stem=PL=1incl

(23) **'beeda=ka=be**
came= PL=3h
'They came'

WITH QUANTIFIERS: The bound third person plural forms may also occur with a quanitifier, as in (24) and (25):

(24) **'beeda i'ropa= ka=be**
came the two=PL=3h
'Both of them came'

(25) **'beeda 'čupa=ka=be**
came two= PL=3h
'Two of them came'

Applying some of the Zwicky tests specifically to these bound pronouns, they can be shown to be either words or clitics.

1. As CLITICS:

(a) Zwicky test 2.34: They have strict ordering in relation to other words in the sentence, more affix-like.

(b) Zwicky test 2.2: They are accentually dependent.

(c) Zwicky test 2.31: They are bound.

2. As WORDS:

(a) Zwicky test 2.33. Construction: They occur with multi-word phrases.[3]

(b) Zwicky test 2.41. Deletion: They can be deleted under identity, in the case of relative clauses:[4]

(26) **ba?du ni='beeda 'neege**
child REL came yesterday
'the child who came yesterday'

***'ba?du ni='beeda=be 'neege**

(c) Zwicky test 2.6. Metacriterion: From his tests there is a lack of clear evidence for classifying them one way or the other.

CONCLUSION. If we must assume (as Zwicky does) that the term clitic is per se an "acategorial" term in the same sense as affixes (though I am not convinced this is necessary), then I suggest the use of another term: DEPENDENT WORD (or BOUND WORD)[5] to cover all forms which are not clearly affixes and yet which cannot stand in isolation. This would include the following three situations:

(a) bound atonic forms such as the IZ pronominal morphemes and most of the other bound forms in the language.

(b) bound nonaffixal forms which do carry stress, as in the IZ **'ǰaata** 'over much' (6) and **'saa** 'reciprocal' as in (27):

(27) **na'ǰii='saa=ka=be**
love= REC= PL=3h
'They love each other'

(c) "leaners" (Zwicky 1982), such as prepositions and determiners in some languages, which may or may not carry stress.

I would like to think of the term **clitic** (or even **particle**) as a convenient analytical (pretheoretical) term for such in-between-type distributions, but the term **dependent** (or **bound**)[5] word as useful in the grammatical description-- with all words, whether independent or dependent, having grammatical category membership.

NOTES

* The quality of this paper was improved by comments from John and Margaret Daly, Allan and Carole Jamieson, Barbara Hollenbach, Larry Lyman, and Stephen Marlett. Lack of further improvement is my own responsibility.

[1]The symbol '=' is used to indicate a division between a clitic and its host or between two successive clitics. Aspect prefixes are not indicated. Phonological-phrase stress is indicated by preposed apostrophe. Contrastive tone and word stress are not marked.

Abbreviations in the literal translations are:

3h	3rd person human
3a	3rd person animal
2s	2nd person singular
1excl	1st person plural exclusive
1incl	1st person plural inclusive
Q	question marker
PL	plural
FOC	focus marker
PERS	person (base form)
POS	possessed by (base form)
REC	reciprocal

[2]A few are free forms (8); several are bound but carry phonology phrase stress (6).

[3]In addition, pertinent to construction potential, they may be modified by a preposed plural clitic.

[4]The Zapotec languages do not have deletion under identity in complement clauses, e.g.:

raka'la?ǰi=be 'če=be ***raka'la?ǰi=be 'če**
wants= 3h go
'S/he wants to go'

[5]"Dependent word" is the term I have used for IZ clitics (Pickett 1960:22). The term "bound word" is from Zwicky 1977 and Nevis 1985, although their respective definitions for this term are different, and neither uses it to include all types of clitics.

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* A more complete bibliography may be found in some of these monographs and articles.

CONTEXTUAL DETERMINANTS OF THIRD-PERSON CLITIC USAGE IN SPANISH

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Introduction

Object pronouns, or clitics, have stimulated research on the Spanish language carried out by traditional grammarians, structuralists, generativists, and post-generativists. The third person clitic pronouns in Spanish have traditionally been referred to as (1) the reflexive se, (2) the dative le(s), and (3) the accusative lo(s)-la(s).

García (1975) presents a very interesting semantic and pragmatic analysis of the Spanish pronoun system, using a 'form-content' approach. Abandoning the assumption that form and function can be studied independently of each other, she claims that each clitic pronoun (form) has associated with it a specific meaning (function or content). However, language is also quite versatile, since the same meaning can convey different messages in different contexts (41). The mental process whereby messages are derived from meanings is called inference (42). Hence the notion is that a user of a language infers particular messages from utterances which can be analyzed as sequences of meaning-carrying signals. Also, inference of messages is highly dependent on context and general knowledge.

García then defines the meanings of the different clitic pronouns in Spanish in terms of person, activeness, focus, and deixis. She then illustrates the inferential strategies which she believes a native user of Spanish employs in either producing or interpreting an utterance.

The present study[1] tests out certain aspects of her analysis in an empirical way by means of a questionnaire which was administered to 49 subjects, all native speakers of Spanish living in the New Jersey-New York City area. Since the items were randomized, the order of discussion here is not the same as that presented to the subjects.

García (1975) used questionnaires and Argentine novels as a means of gathering data for the Buenos Aires dialect area. The present study investigates other dialects of Spanish spoken in the United States (especially those of the Caribbean area), to test two findings of García and Otheguy (1977:83): (1) that the meanings of the forms of the clitic pronouns and the inferential strategies used are the same for all informants participating in their study, and (2) that dialect differences are probably due to differences in the absolute strength of the strategies and the ranking of the strategies. The questionnaire for the present study takes the form of written paragraphs or long sentences,

rather than sentences in isolation, in order to provide a proper context. In Part I, the subjects are to choose between a singular and a plural verb preceded by se in four different items given in random order. In Part II, they are to fill in blanks with one of the pronouns: le(s), lo(s), or la(s) in 28 different items presented in random order. In this paper, 10 of the items of Part II will be discussed. Of the 49 subjects responding, 17 are of Cuban background, 16 Puerto Rican, 5 Dominican, 5 Colombian, one is half Cuban and half Puerto Rican, one of half Ecuadorian and half Nicaraguan, one Honduran, one Peruvian, one Argentine, and one Spanish. Most have lived in more than one Spanish-speaking country or Spanish-speaking area of the United States. It is suspected that 31 of the subjects may be English-dominant, whereas the other 18 are definitely Spanish-dominant. Dialect differences are not treated in this paper. Language dominance is treated in Uber (1984). The questionnaire requires approximately 15 minutes to complete. It was purposefully formulated in an informal style, using everyday vocabulary, so that English-dominant bilinguals would not have problems with comprehension.

The Construction se + Verb + NP

García (1975) states that the form se has the meaning OTHER (i.e., third person) and LOW DEIXIS (i.e., the hearer need not search hard nor far for the referent of the pronoun, since the referent should be obvious). Se is unspecified for degree of activeness, so that it may be used to refer to most, less, or least active participants. Se is also neutral to focus, which is 'the system dealing with the concentration of attention on one of the participants talked about' (69). The most active participant is not necessarily the one in focus. For example, in

Se vendieron los autos. 'One sold the cars.'

the most active participant is some indefinite person(s), and the least active participant is the cars. However, the cars are in focus, hence the verb agreement between vendieron and autos (204-207).

On the other hand, many speakers of Spanish use a third person singular verb, regardless of the number the least active participant takes:

Se vendió el auto. 'One sold the car.'

Se vendió los autos. 'One sold the cars.'

García (1975:209-214) claims that the third person singular verb is less acceptable if the least active participant is (a) more definite or important, or (b) human (as opposed to non-human or inanimate). In other words, as the least active participant becomes more worthy of focus, it is more likely that the verb will agree with it in number. Therefore, we would expect that, whereas it may be possible to encounter:

(1) Se vende cigarrillos aquí. 'Cigarettes are sold here.'

it should be less likely to encounter:

(2) Se vende los mejores carros del mundo aquí. 'The best cars in the world are sold here.'

Both sentences were presented to the subjects participating in

this study in the context of advertising:

(1) Un anuncio en la vitrina de una tienda:

'Se vende / venden cigarrillos aquí.'

(2) Un anuncio para un comerciante en carros:

'Se vende / venden los mejores carros del mundo aquí.'

Since los mejores carros del mundo is a more definite noun phrase than cigarrillos, a singular verb should occur less frequently with the former NP than the latter NP. Indeed, while most of the subjects choose the plural verb over the singular in both examples (1) and (2) above, fewer choose the singular as acceptable in (2) than in (1). The results are shown in Table 1. The number of

	Ex. (1)	Ex. (2)
% of singular responses	33.3%	26%
% of plural responses	66.7%	74%
Ratio of pl. to sing.	2	2.85
% of subjects choosing both	9.3%	4%

TABLE 1.

responses to a given item does not always total 49, because some subjects failed to choose a verb, and some circled both choices for certain items. Hence, the responses of the subjects who circled both choices in example (1) are also counted in the singular and plural responses. The ratios of number of plural responses to number of singular responses show that there are 2 times as many plural responses as singular for example (1), and 2.85 times as many plural as singular for example (2).

These items can also be viewed with regard to an implicational hierarchy. One would expect that a plural response for (1) would be accompanied by a plural response for (2) from the same subject, since (2) contains a more definite least active participant. Only 5, or 10.2% of the subjects, violate this implication by choosing a plural verb in (1), but a singular in (2).

We would also expect that, whereas we might encounter the sentence:

(3) Se busca secretarias. 'Secretaries wanted.'

we would be less likely to encounter:

(4) Se necesita estas tres secretarias bilingües para la la conferencia. 'These three bilingual secretaries are needed for the meeting.'

(3) was presented in the questionnaire as a sign, and (4) was presented in the context of a conversation between two executives:

(3) Un anuncio en la ventana de una oficina:

'Se busca / buscan secretarias.'

(4) Dos ejecutivos de una compañía discuten el trabajo que les van a dar a las cinco secretarias de la oficina. Uno dice:

'Se necesita / necesitan estas tres secretarias bilingües para la conferencia.'

Since estas tres secretarias bilingües is a more definite noun phrase than secretarias, a singular verb should occur less frequently with the former NP than with the latter NP. Again, while most of the subjects choose the plural verb over the singular in both examples, fewer choose the singular as acceptable in (4) than in (3) as shown in Table 2. The ratios of number of plural

	Ex. (3)	Ex. (4)
% of singular responses	42.9%	17.7%
% of plural responses	57.1%	82.2%
Ratio of pl. to sing.	1.33	4.63
% of subjects choosing both	6.1%	2.0%

Table 2.

responses to number of singular responses show that there are 1.33 times as many plural responses as singular for example (3), and 4.63 times as many plural as singular for example (4). Thus, it would appear that the NP estas tres secretarias bilingües is viewed as a very definite and important NP, certainly deserving of focus, which is marked by a plural verb ending.

We should also view (3) and (4) in terms of an implicational hierarchy. One would expect that a plural response for (3) would be accompanied by a plural response for (4) from the same subject, since (4) contains the more definite least active participant. Only 3, or 6.1% of the subjects, violate this implication by choosing a plural verb in (3), but a singular in (4).

It appears to be true that a more definite NP is more likely to require a plural verb in se + Vb + NP constructions. However, at least for these subjects, a human NP, which is found in examples (3) and (4), is not necessarily more likely to require a plural verb in such constructions. Note that the ratio of number of plural responses to number of singular responses for (3) is 1.33, lower than the ratios for either (1) or (2), which are 2 and 2.85, respectively. The high ratio of 4.63 for (4) may be due to the definiteness of the NP (estas tres secretarias bilingües), rather than to the fact that it refers to humans. This NP is, of course, more definite than that of (2) (los mejores carros del mundo), since the latter does not refer to specific cars. Rather, (2) claims that the cars sold at that dealership, whatever cars they may have in stock at the time, are the world's best. Hence the lower ratio, 2.85, for (2).

The high plural to singular ratio of 4.63 for (4) may also be due to the fact that it is the only one of the four sentences whose context is that of a discussion or conversation. Examples (1), (2), and (3) are presented in the context of signs or advertisements. It is possible that the expressions se vende and se busca, in the context of signs or advertisements, have become lexicalized in the singular form, regardless of the number of the following NP. (This idea arose from a personal discussion with Karen H. Kvavik.) Since so many public announcements show these expressions in the singular, perhaps they have been interpreted as single lexical items se vende and se busca in this context.

Morales de Walters (1977) carried out a study which asked Puerto Rican informants from the San Juan metropolitan area to accept or reject certain sentences containing the 'impersonal se' construction. She finds that her informants reject (with an average of 66.44%) sentences in which the verb and following NP do not agree in number, whereas they accept (with an average of 78.18%) those sentences showing such agreement. In a second part to her study, where informants were to choose a verb form, they prefer the form showing verbal agreement with the following NP with an average of 85.13% (1977:98-99). Of the 17 subjects responding to the questionnaire for the present study who have some Puerto Rican background, 12 (or 70.6%) of them prefer verbal agreement (i.e., plural verb) for examples (1), (3), and (4), while 11 (or 64.7%) prefer verbal agreement for example (2). Although the percentages for the present study are slightly lower than those of Morales de Walters, there does appear to be a correspondence between New Jersey-New York Puerto Ricans and island Puerto Ricans, in that, for the se + Vb + NP constructions tested, verbal agreement is preferred.

Le(s) vs. lo(s), la(s)

Other clitic pronouns which have long been the object of study are le(s), traditionally described as 'dative', or 'indirect object', and lo(s)-la(s), traditionally described as 'accusative', or 'direct object'. However, there is much variation throughout the Spanish-speaking world in the usage of these forms in contexts requiring only one clitic pronoun.

García (1975) defines the form le(s) as having the meaning OTHER (third person), NON-FOCUS (meaning that the participant which it refers to is not in focus), HIGH DEIXIS (the referent is not obvious), and LESS ACTIVE. Le(s) has the meaning LESS ACTIVE, in contrast with lo(s)-la(s), which refer to a LEAST ACTIVE participant. Lo(s)-la(s) share with le(s) the meanings OTHER, NON-FOCUS, and HIGH DEIXIS. She states that le(s) tends to be used for people, because it reflects a more active role than lo(s)-la(s), which tend to be used for things. This claim is also made by Bolinger (1950:239), in which he gives the examples Les creemos for persons and Los creemos for things. Along these lines, Part II of the questionnaire for the present study asks subjects to choose between le(s), lo(s), and la(s) for examples in contexts requiring only one clitic pronoun. The first two examples are:

(1) Se dice que las rubias son tontas, pero no _____ creo. 'It is said that blondes are dumb, but I don't believe it.'

(2) Carlos es tan mentiroso que ahora no _____ creemos cuando él nos dice algo. 'Carlos is such a liar that now we don't believe him when he tells us anything.'

We would expect a higher percentage of le usage in (2) than in (1). Table 3 shows the results. (Anomalous responses are not shown in the tables, because they represent no more than 12% of the responses for any item.) It can be seen that lo is the clear

	Ex. (1)	Ex. (2)
% of le responses	0.0%	56.3%
% of lo responses	95.8%	35.4%

Table 3.

preference in (1), where the referent is not a person, but rather an idea. For example (2), 1.58 as many subjects choose le as choose lo. Our prediction is supported by the data, but not as strongly as in (1). A factor which may have contributed to the number of lo responses in (2) is that subjects could have interpreted it as meaning 'Carlos is such a liar that now we don't believe it when he tells us anything.' We should, however, examine the implicational hierarchy for these examples. We would expect that a le response in (1) would imply le in (2), or, conversely that a lo response in (2) would imply lo in (1). There are no violations of these implications, even for those responding les or los (which are taken here to be variants of le and lo, respectively). Thus, it is the case that le tends to be used for persons and lo for things.

Zlotchew (1969) notes that the verb querer means 'want' but takes on the meaning of 'love' when applied to humans. He also states 'I have heard in conversation among Colombians the term "lo quiere" to indicate "she wants you" (to tell you something, to do something for her, etc.) as opposed to "le quiere" for "she loves you".' (870) Part II of the questionnaire for the present study contains the following 3 examples:

(3) Elena es muy buena secretaria. Hoy su jefe _____ quiere para darle una tarea muy importante. 'Elena is a very good secretary. Today her boss wants her, in order to give her some very important work.'

(4) Marta es la esposa ideal. Su marido _____ quiere mucho. 'Marta is the ideal wife. Her husband loves her very much.'

(5) Estoy muy enamorada de Juan. _____ quiero mucho. 'I am very much in love with Juan. I love him very much.'

One would expect to find la for (3) and le for (4) and (5), if this distinction operates for the subjects participating in this study. However, as can be seen in Table 4, lo (la) is preferred for all three items. It is clear that these subjects do not

	Ex. (3)	Ex. (4)	Ex. (5)
% of le responses	8.6%	6.5%	10.6%
% of lo-la responses	84.8%	91.3%	89.4%

Table 4.

prefer le with querer when it means 'love'. In fact, of the five Colombians participating, four used lo-la in all 3 items, while one used lo-la in (4) and (5) and le in (3), which is precisely the item in which le is not the expected response. It is not clear what dialect area of Colombia is the one which shows the distinction referred to by Zlotchew. Since there are several dialect areas in Colombia, it is confusing to refer to 'Colombian

Spanish'.

In terms of implicational hierarchies, we would expect that a le response in (3) would imply le in (4) and (5), or that lo-la in (4) or (5) would imply la in (3). Five, or 10.2%, of the subjects violate this implication.

García (1975) states that lo is preferred over le in two-participant situations as a way of maximizing contrast: most active (represented by the verb ending) and least active (lo) provide more contrast than most active (verb ending) and less active (le). Le will then be used in two-participant situations whenever there is reason not to maximize that contrast (signaling less distance than usual between the participant in focus and the one out of focus). She finds le to be favored (over lo) when it refers to men, or to people worthy of respect. In addition, García and Otheguy (1977:75) find le to be favored (over lo) for objects of unknown gneder. Part II of the questionnaire contains 3 items with the verb llamar 'to call':

(6) Tengo que hablar con Luisa. _____ voy a llamar. 'I have to talk to Luisa. I'm going to call her.'

(7) Debemos consultar al médico en cuanto a tu enfermedad. _____ voy a llamar. 'We should consult the doctor regarding your illness. I'm going to call him.'

(8) Necesitamos ayuda con las víctimas. Aquí viene alguien. ¡Llama_____! 'We need help with the victims. Here comes someone. Call him/her!'

In (6), the object pronoun refers to a female, in (7) to a male physician who may also be worthy of respect, and in (8) to a person of unknown gender. We would therefore expect the percentage of le usage to be higher in (7) and (8) than in (6). Table 5 shows the results. While it is clear that la is the norm for the

	Ex. (6)	Ex. (7)	Ex. (8)
% of le responses	6.3%	2.2%	20.0%
% of la responses	93.8%	-----	20.0%
% of lo responses	-----	95.7%	48.0%

Table 5.

female object, it is just as clear that lo, not le, is the overwhelming favorite for the male object who may be worthy of respect. In fact, we find slightly more le usage in (6) than in (7). García and Otheguy (1977) find that the sex of the object is the strongest inferential strategy on the choice of le for their subjects. On the contrary, the present study shows that the extent to which the gender of the object is known is more important for the choice of le. Of these three items, example (8) shows the highest percentage (20%) of le. However, there is definitely confusion as to which form to use in (8), given that this item shows the greatest variety of responses. It is interesting to note that all but one of the subjects giving a feminine object pronoun as a possible response for (8) are female.

Part II of the questionnaire also includes two items with the verb ayudar 'to help':

(9) Hijo, tu abuelita no puede subir la escalera sola. Debes ayudar_____. 'Son, your grandmother can't go up the stairs alone. You should help her.'

(10) Mis hermanas están limpiando la casa. Voy a ayudar_____. 'My sisters are cleaning the house. I'm going to help them.'

Both of these examples have feminine objects, so we might expect the responses to be la. However, a grandmother is a person worthy of respect, which would lead us to also expect le in (9). In (10) the sisters are more active, and providing a greater contribution than is the speaker, so we might also expect le. The sisters in (10) are also more active than the grandmother in (9), who is not able to climb stairs alone. Table 6 shows the results. In (10),

	Ex. (9)	Ex. (10)
% of le(s) responses	4.2%	17.3%
% of la(s) responses	93.8%	73.9%

Table 6.

le and la responses are not counted as anomalous, but are included with le(s) and la(s), respectively. Vaquero de Ramírez (1977) has shown that in San Juan Spanish the final -s of a plural object pronoun is generally deleted when its referent NP is expressed in the context.

It can be seen again in example (9) that respect is not an important factor in the choice of le for these subjects. However, it does appear that the relative activeness of the referent has some influence on the choice of le. The topic of activeness of the referent is treated in Uber (forthcoming), with the results of research on 18 other examples from the questionnaire.

Conclusions

This study has tested out, empirically and in context, various hypotheses dealing with the choice of clitic pronouns in New Jersey-New York Spanish. For the data presented here, it does appear that we can support the findings of García and Otheguy (1977) that the meanings of the forms of the clitic pronouns and the inferential strategies used are probably the same for all speakers, especially given the heterogeneous group who participated in the present study. However, the inferential strategies do not have the same relative weights for all speakers.

With regard to constructions of se + Vb + NP, a more definite NP, more worthy of focus, is more likely to require a plural verb than a less definite NP. It has also been suggested that the expressions se vende and se busca may have become lexicalized in the singular form, regardless of the number of the following NP, in the context of signs or advertisements.

With regard to le(s) vs. lo(s)-la(s), we have shown that le(s) does have the meaning LESS ACTIVE, as opposed to the LEAST ACTIVE lo(s)-la(s). Le tends to be used for people, lo for things. We have shown that le is not preferred with querer to mean 'love', but rather that lo is used by the vast majority of the subjects.

It has also been shown that an object of unknown gender may co-occur with a wide variety of pronouns: masculine lo, feminine la, neuter le, or plurals of any of these. Male participants, or participants worthy of respect are not found to be a factor which favors le. This finding is counter to the results of García and Otheguy (1977), who find that the sex of the object is the strongest inferential strategy for the choice of le, for their subjects. The present study has, however, shown that the relative activeness of the referent has some influence on the choice of le. This inferential strategy, and more data in support of it, are examined in Uber (forthcoming).

The enterprise which has been carried out here is of great importance in linguistics because a serious analysis has been examined by means of an appropriate test, devised to ascertain whether this analysis is a plausible one. This study has yielded new data in support of the form-content analysis of the meanings and inferential strategies involved in the usage of Spanish clitic pronouns.

Note

[1]This is a revised version of a paper presented at the conference on Spanish in the United States IV: Committed Research, held at Hunter College, CUNY, October 7-8, 1983 in New York City. This research was supported by a summer fellowship from the Research Council of Rutgers University for the summer of 1983. I would like to thank the Council for their generosity. I would also like to extend my heartfelt thanks to all of the subjects who participated in this study. Special thanks to my colleagues and students in the Department of Spanish and Portuguese, Rutgers University, for giving their personal time, and that of some of their classes, to fill out the questionnaire. Finally, I am most grateful to Karen H. Kvavik and Erica C. García for discussions on topics related to this paper. All remaining errors are, of course, my own.

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V

SEMANTICS

THE MEANING OF **TO** BEFORE THE INFINITIVE*

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As the title of this paper says, we will be looking at the **to** which is used with the English infinitive as a linguistic element which has a meaning of its own. Such an approach might seem somewhat surprising at first sight, and justifiably so, since it does not correspond at all to the usual way of dealing with the particle **to** in English grammar: with few exceptions,[1] most commentators simply take for granted that the use of **to** before the infinitive is wholly determined by the context and has nothing to do with the meaning which the speaker wishes to express. A typical example of this kind of treatment can be found in Curme's Syntax (1931: 456), where the **to**-infinitive is presented as the living form and the bare infinitive as a "fossil" which has survived only in certain contexts. In this view, history has arbitrarily decided that **to** would be used in some contexts but not in others. A quite similar view is implied in Jespersen (1940: 154) when it is said that "**to** has now become a mere empty grammatical appendix to the infinitive". Once again, there appears to be no rationale behind the use or non-use of **to** - like the appendix, it can be cut out or left in, since it presumably fulfils no function in expressing meaning. Chomsky (1957: 100) says much the same thing when he comments that **to** is a morpheme that "can hardly be said to have a meaning in any independent sense" and therefore falls into the same category as "dummy **do**". The upshot of the treatment of the infinitive in much of English grammatical analysis, then, is that the **to** preceding it is meaningless: **to** is simply the sign needed to show that the verb form is an infinitive in certain contexts. The difficulty with this view is that no reason is given to explain why **to** is necessary in these contexts, nor to justify why it cannot be used with the infinitive in others. Ultimately, the problem with such approaches resides in the fact that language is considered as a rule-bound behaviour rather than a meaning-oriented activity.

In the case of the use of **to** before the infinitive, moreover, a treatment in terms of contextual rules breaks down very

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1 Cf. Erades 1950 and Bolinger 1974. However both comment only on isolated contexts and make no attempt to extend their observations to other uses of the **to**- and bare infinitives.

*This paper was one of two which received the Presidents' Commendation.

quickly when confronted with the actual facts of usage. To start with, there are several verbs which can be followed by both the bare and the **to**-infinitive in present-day English. One such verb is **have**:

(1a) He had four examiners **ask** him all kinds of questions.
(1b) He had four examiners **to ask** him all kinds of questions.

Such usage is difficult to reconcile with an analysis of the infinitive as having two contextually determined variants: if the context determines which variant is used, then one should not expect to find both versions in the same context. It might nevertheless be conceivable that the bare and **to**-infinitives are in free variation after **have**, the choice of one or the other being completely random and indifferent. Once again, however, such a treatment would run ashoal on the facts of usage: it is obvious in the pair of sentences above that the presence or absence of **to** is determined by the meaning which the speaker wishes to express. In (1a), one understands that the event denoted by the infinitive (the asking of all kinds of questions) actually took place: **have** has the sense of 'experience' here, and the sentence means that the speaker actually underwent the examination. In (1b), however, we do not know from the sentence whether he was examined or not: **have** no longer means 'experience', but merely evokes the fact of his being in the presence of four examiners, who were there in order to ask him questions. Usage with **have** shows therefore that the bare and **to**-infinitives are not mere contextual variants of the same form but are actually used to express different meanings. What is even more significant about this usage, however, is that it can provide a basis for discerning some sort of a rationale behind the use or non-use of **to**. This rationale has to do with the temporal relationship between the events expressed by the main verb and the infinitive.

If one tries to analyse the time-relationship between the events evoked by the main verb and the **to**-infinitive after **have** in (1b), one finds a relation which could be described in terms of a sequence of events. In the sentence just referred to the **to**-infinitive denotes the **finality** of having: the four examiners were there in order to ask him questions. Seen in temporal terms, this implies that the asking is future with respect to the having. In other words, there is a before/after sequence between **have** and **ask**: the having is represented as having really existed at some moment in the past (the examiners were really there), and the asking is represented as having been supposed to ensue (although we do not know whether it actually did or not). This suggests that the role of the particle **to** in this sentence

could be depicted as that of evoking a possible movement in time from one event which represents a before position to another which is supposed to come after. This is illustrated in the following diagram:

(2)

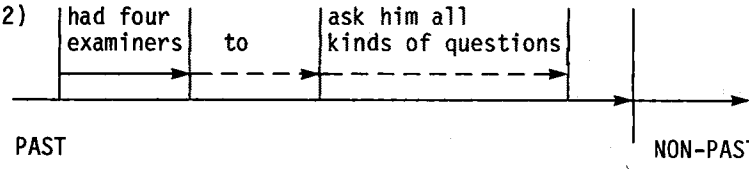

Diagram of **He had four examiners to ask him all kinds of questions.**

This before/after time-relationship is not found only with the verb **have** moreover: it is characteristic of the great majority of the uses of the infinitive with **to.** It applies, for example, to contexts with verbs like **want, wish, intend, hope, try:**

(3a) I want **to finish** by 11:55.
(3b) I wish **to finish** by 11:55.
(3c) I intend **to finish** by 11:55.
(3d) I hope **to finish** by 11:55.
(3e) I am trying **to finish** by 11:55.

It is also found in a great many uses after adjectives:

(4a) You are free **to leave.**
(4b) He is ready **to work.**
(4c) He is qualified **to handle** this case.
(4d) She is liable **to get** mad.
(4e) These apples aren't fit **to eat.**

It is not, however, the only type of relationship which **to** can express, and we shall be looking at another type in a moment. Before we do that, it would be useful to take a look at the meaning of the bare infinitive as used in (1a) above, for it too can be formulated in terms of the temporal relationship between the events of the main verb and of the infinitive.

In (1b), as we have seen, **to** is used to signify a before/after relation between the event of the main verb **(have)** and that of the infinitive **(ask).** An examination of the relationships involved in (1a) reveals however that the event expressed by the bare infinitive is represented as occurring, not after, but **at the same time** as that of the main verb. Since **had** means 'experienced' here, it only seems logical that the experiencing - the having - and the event experienced - the asking - should be

represented as occurring at the same time: one can only experience something while it is happening. The bare infinitive after **have** thus evokes its event as simultaneous with that expressed by the main verb. This observation about the meaning of the bare infinitive casts further light, in addition, on the reason for the use of **to** in (1b): if the bare infinitive itself signifies simultaneity, one can understand why **to** should be necessary if one wishes to represent the infinitive event as yet to come with respect to that of the main verb.

These remarks concerning the bare infinitive are pertinent in dealing with certain uses of the infinitive with **to** where the posteriorizing effect of the particle is more abstract and therefore less easy to perceive. One such case is after the verb **help:**

(5) He helped me **to climb** the stairs.

Commenting on the difference between this example and the same sentence without **to,** Bolinger (1974: 75) remarks that (5) above could be completed by a clause such as **by cheering me on.** Obviously in such a context the helping (**ie** the cheering) and the climbing both take place at the same time. It would seem therefore that **to** is no longer being used here to evoke the infinitive's event as coming after that of the main verb; on the contrary, the **to**-infinitive appears to denote exactly the same thing as the bare infinitive does after **have,** namely an event which is contemporaneous with that of the main verb. One has to bring in the contrast with the bare infinitive construction in this case in order to see that **to** continues to evoke a posteriorized event here as well, albeit in a more abstract way.

As regards the construction with the bare infinitive:

(6) He helped me **climb** the stairs.

Bolinger **(Ibid.)** feels that it implies that the helper climbed the stairs along with the speaker: he comments that this sentence could best be completed by a clause such as **by propping me up with his shoulder.** Bolinger summarizes the distinction between (5) and (6) by saying that the bare infinitive construction evokes "immediate", and the **to**-infinitive construction, "mediate" assistance. It is significant here that the **to**-infinitive should be felt to evoke a form of assistance which is less direct and involves the helper less closely in the action for which help is being given: even though the helping may occur at the same time as the event of the infinitive, **to** brings in the notion of some kind of distance between the two events which is not evoked if the bare infinitive is used. A further pair of examples will serve to make this more precise.

The difference between the following two sentences is discussed by Erades (1950: 123):

(7a) Will you help me **get** these letters addressed?
(7b) Will you help me **to get** these letters addressed?

Erades feels that, like (5) above, (7a) evokes a close involvement of the helper in the realization of the infinitive event: this sentence, he says, "can only mean one thing, viz. will you share with me the work of addressing them?". (7b), on the other hand, evokes indirect assistance: Erades comments that the sentence with **to** allows the interpretation that "the help may be afforded by some other means, such as relieving the speaker of other tasks or duties" (one could imagine someone saying 'if you will take care of answering the phone, that will help me to get these letters addressed'). Taken together with (6), moreover, (7b) allows one to see more clearly what is behind the impression of distance and indirectness associated with **to** : the latter is used whenever helping is conceived as simply providing favourable conditions for the infinitive event to take place. Thus in (6) the cheering is represented as putting the speaker in the right spirits to climb the stairs, and in (7b) taking care of the phone provides the speaker with the time necessary for him to be able to address the letters. **Help** evokes therefore the creating of what could be called 'enabling conditions', and the **to**-infinitive evokes that which the principal agent is able to accomplish because of these conditions. In other words, there is a relation of condition to consequence between the helping and the infinitive event when **to** is used.

A moment's reflection on this condition/consequence relation reveals that we have here a more abstract version of the same before/after relationship which was observed with **have** + **to**-infinitive: intuitively, conditions are felt to somehow precede consequences. However, since - as was pointed out with respect to (5) above - enabling conditions do not always come before their consequences in real time, this before/after relation is to be found on another level. It is proposed here that **to** evokes the posteriority of the infinitive event with respect to **help** on the more abstract level of the relation between notions: the very idea of a condition as something which is partly or wholly responsible for the existence of certain consequences implies a notional priority of the condition with respect to the consequences which depend on it for existence. If, therefore, the speaker conceives helping as the providing of enabling conditions for someone else to realize an event, this implies the representation of a purely notional sequence between the helping and the infinitive event and calls for the use of **to**. If, on the other hand, helping is conceived as an active cooperation of the helper with the principal agent (cf. (7a)), then helping is represented

as coinciding in time with the event for which help is being given, and the bare infinitive must be used. As with **have**, therefore, the use of **to** after **help** also signifies posteriority - although on a more abstract level - and the absence of **to** denotes simultaneity or coincidence in time.

There is thus a contrasting pattern of relationships between the event denoted by the main verb and that expressed by the infinitive according to whether the latter is preceded by **to** or not. It must be admitted nonetheless that this is a very limited area of usage, and so this observation might not appear very significant. However, the pattern described above is not restricted merely to the verbs **have** and **help**: it is also found with a whole group of verbs which can be followed by both the bare and the **to**-infinitive - the verbs of perception.

From what has just been seen, it should come as no surprise to find the bare infinitive in sentences like:

(8) I saw him **cross** the street.

(9) I heard him **walk up** the stairs.

The perceiving of an event takes place at the same time as the event which is perceived. What is not so obvious, however, is the reason for the use of the **to**-infinitive in other sentences, such as:

(10) I saw them **to be** obnoxious.
(Bolinger 1974: 66)

(11) We might hear him by his blowing **to be** a monstrous, huge and furious beast.

(Jespersen 1940: 281)

Nevertherless, more careful reflection reveals an underlying before/after relationship in these uses as well.

A good starting-point for showing this relation is Jespersen's distinction (1940: 280) between what the verbs of perception express when followed by the bare infinitive, and what they denote when used in the **to**-infinitive construction. With the bare infinitive, these verbs are said to express "immediate perception"; with **to**, however, they evoke another notion which Jespersen calls "inference". Now what is significant is that whereas perception is, in Jespersen's own terms, "immediate" - it is an immediate laying hold of a phenomenon by the senses - inference involves two levels. To infer is to jump **from** what one perceives **to** a conclusion by means of some sort of reasoning pro-

cess. This implies that an inference comes into existence only after - and as a result of - the mental operation required to infer it from what has been observed directly. The use of **to** before the infinitive when the verbs of perception take on the sense of 'inference' is therefore no accident: it fits in with the same pattern as **have** and **help.**

One could go through all the various uses of the **to**-infinitive after another verb in this way and discern a semantic motivation for the use of **to.** [1] Suffice it to say here that a careful observation of the English infinitive leads to the realization that, far from being an "empty grammatical appendix" or a "dummy word", **to** expresses a meaning of its own. We have seen in a limited sample of contexts that **to** situates the event of the infinitive in time after that of the main verb. The bare infinitive, on the other hand, evokes its event as occurring in the same time stretch as the event of the main verb.

English appears therefore to be much more systematic in its infinitival usage than it has been given credit for up to now. The sign **to** is used before the infinitive because it expresses the way the speaker conceives the infinitive event: he represents it as coming after something else; **to** is not used when the infinitive event is felt to be contemporaneous with some point of reference. The use of **to** is therefore the result of a choice by the speaker, which is conditioned by what he wants to say and not by the mechanical application of a contextual rule (we have seen that in certain contexts the speaker is free to select one or the other version). Like Hamlet, then, in some cases, the English speaker is faced with a "dilemma" when he uses the infinitive: **to** or not **to** - that is the question.

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1 This has been undertaken in an extensive study of the contrast between the bare and **to**-infinitives (Duffley 1986).

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TRANSLATING ENGLISH EMPHASIS INTO FRENCH: A SEMEMIC APPROACH

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In this computerized era, little attention has been paid to the role of stress, pitch and intonation in English as meaningful units. One reason, as Yuen Ren Chao (1962) suggests, is that "they are less amenable to machine translation...since they usually are not written at all in conventional orthography". He goes on to infer that they are essential, however, to the message. I will attempt here to show that emphasis, the forceful stress or intonation applied to an utterance in order to single out one of its lexemes is a meaningful unit, and as such is quite validly shown when translation into another language, French in this case, is attempted.

The translational approach is, in effect, a worthy method of studying semantic elements in the sense that empirical meaning is "what the sentences of one language and their firm translations in a completely alien language have in common".[1] In essence, a bonafide translation is one in which all the sememes of a given utterance of the source language are realized in the lexemes of the target language utterance.

The traditional studies of English emphasis (Vinay-Darbelnet, 1958), even those done through the translational comparative approach of English and French, have dealt mainly with the lexotactic variations between the French and English manners of expressing emphasis. No attempt has been made at identifying the sememes which are conveyed by the use of emphasis in either language.

The goal of this paper will be to identify the most predominant sememes carried by emphasis. The question of the idiomaticity of some emphatic utterances in English will also be discussed.

1. The Paradigmatic Approach

Granted, other methods of illustrating the semantic nature of a linguistic unit are available. The paradigm is a favorite, principally because it splits the content from its expression, as it divides itself into expression paradigms and content paradigms.[2] Paradigmatic illustrations of morphemic emphasis are seen below. Because emphasis in English is realized at the phonemic and the morphemic levels of the language system, on the suprasegmental plane rather than on the segmental plane, it must be shown in a written text by artificial graphemic devices. Underlining the lexeme on which emphasis is placed is the most popular way of

accomplishing this in a written text. In this paper, the English lexeme carrying emphasis will always be underlined.

EXPRESSION	CONTENT
That is pretty.	That (there) is pretty. (and not something else)
That is pretty.	That is (really) pretty. (or contrary to what you think)
That is pretty.	That is (very) pretty. (or rather than beautiful, handsome, ugly, repulsive, etc.)

* * * * * * * *

He did that.	He (and no other) did that.
He did that.	He did (in effect) that.
He did that.	He did that (thing there).

In both cases the expression paradigm presents emphasis within the same phrase but placed differently. The content paradigms spell out in parentheses the meaning of each occurence of emphasis. Presumably it is the correspondance of this emphasis to that which is enclosed in parentheses which points out the existence and type of meaning carried by the emphasis.

2. The Translational Approach

But the most convincing illustration of the sememic nature of emphasis comes in comparison with its translations in French.[3] A rise in the voice or pitch in English is nearly always translated into lexemes in French. And where do these lexemes come from if not from the need to express a meaning? How are they chosen if not according to the meaning implied by the emphasis? Let us consider our second paradigmatic example in light of its translation.

He did that.	C'est lui qui a fait ça.
He did that.	Il l'a fait, en effet.
He did that.	C'est ça qu'il a fait.

It must be remembered that these are the grammatical French sentences to translate the English. No catering to the English structure has been permitted, no round-about ways sought after to state something not Gallic. The meanings of each French sentence and its English counterpart are identical.

Likewise, translating the first paradigm involves the addition of lexemes in French to handle the sememe carried by English emphasis:

That is pretty.	Ça c'est joli.
That is pretty.	C'est joli, en effet. C'est vraiment joli.
That is pretty.	C'est joli, ça.

Obviously, not only supplementary lexemes are important, but their order in the sentence as well, as in "Ça, c'est joli" and "C'est joli, ça". But the possible morphemic nature of French word order is not our business here except insofar as it is used to indicate different sememes conveyed by emphasis.

For instance, in translating the English sentences

1. He gave me this book for my birthday.

   C'est ce livre qu'il m'a donné pour mon anniversaire.

2. He gave me this book for my birthday.

   C'est pour mon anniversaire qu'il m'a donné ce livre.

It becomes obvious that it is French lexotactics which renders English emphasis by switching the word order in (1) and (2), forming a different chiasmatic structure between the French and English utterances.

According to Darbelnet-Vinay (Stylistique comparée, 1958), English emphasis is disposed of in French in four principal ways: 1) lexical repetition; 2) other lexical reinforcement; 3) double pronouns; 4) detachment of the important element.[4] Lexical repetition can be illustrated by "it's a very nice day: Il fait très, très beau". Lexical reinforcement is more varied: addition of a word as in "We, Americans: Nous autres Américains"; or even the addition of a syntactic element, and I shall cite Darbelnet-Vinay's example, "At that time Sweden and Norway were one country: A cette époque, la Suède et la Norvège ne formaient qu'un seul pays".

The use of double pronouns permits "That's ridiculous" to become "Ça, c'est ridicule." "I admire you" becomes "Je vous admire, moi." Finally, detachment of the important element brings to the front of the French sentence that emphasized word which in English can be almost anywhere. For example, "I left it here" becomes

"C'est ici que je l'ai laissé". But whatever the manner of disposal, emphasis involves an addition of words in French to account for the unwritten meaning it has in English.

3. The Sememic Value of English Emphasis

I find there to be ten predominant sememes of emphasis which occur with relatively high frequency, though many others are observable. They are: differentiation, intensity, comparison, confirmation of action or of an opinion, surprise, restriction, full understanding, clarification, apropos, propulsion.

3.1 Differentiation

One of the sememes the most commonly carried by English emphasis is the differentiation of persons, objects or concepts, be they the subject or the predicate of a given utterance. Thus to translate the sentence "I know you, Mary" with the emphasis on the subject pronoun, the French must say "Je te connais, moi, Marie", the disjunctive pronoun "moi" carrying the sememe "differentiation from any other person". The sentence "I know you, Marie" will become in French "Je te connais, toi, Marie", the disjunctive pronoun "toi" used in French lexotactics to translate the emphasized English "you", differentiating Marie from any other person whom the subject of the sentence may know.

Another case of 'differentiation' can be found in the sentence: "This book is yours, but that book is mine": "Ce livre-ci est à toi, mais ce livre-là est à moi". The morphemes "ci" and "là" are used in French to translate the sememe 'differentiation' carried by the English emphasis. In the example "This book is yours", in which the sememe 'differentiation' is absent, the French translation will leave out the morpheme "ci" and say "Ce livre est à toi".

3.2 Intensity

Another sememe carried by English emphasis, as shown through its translation into French, is the sememe 'intensity'. Thus the sentence "Your dress is very pretty" will be rendered in French by "Ta robe est très, très jolie" in which the lexical repetition "très, très" translates the English lexeme "very" and its added emphasis. There are cases when English also uses lexical means to indicate emphasis. Instead of using the repetition of the same lexeme as French does, English utilizes an adjectival phrase of the type "good and...". Example: "He was good and mad." In this case, French translates the "good and..." by an "ment" adverb and says: "Il était absolument furieux." The adverb "absolument" realizes the 'intensity' of this person's anger, which is realized in English by "good and...".

Another case of the sememe 'intensity' conveyed by English emphasis is found in the sentences of the type "I admire you", where

emphasis is put on the verbal element of the utterance. Here the sememe 'intensity' of the English emphasis will be translated in French by the lexeme "beaucoup". French will say: "J'ai beaucoup d'admiration pour toi."

3.3 Clarity of Comparison

English emphasis can also take the sememic value 'clarity of comparison' in cases such as "Yours is good, but mine isn't." This sentence is translated in French by "Le tien, à toi, est bon, mais le mien, à moi, ne l'est pas". The emphasis erases all doubts, all possible confusion as to which object is good and which isn't.

3.4 Confirmation of an Action or of an Opinion

In English, emphasis is also used to convey the sememe 'confirmation of an opinion'. As example of this, I will give the following conversation between a policeman and a suspected murderer:

Policeman: "I always figured you were too smart to go for murder."
"Je me suis toujours dit que vous n'étiez pas assez bête pour commettre un meurtre."

Murderer: "I am too smart", confirming thus the policeman's opinion.

The French translation, in this case, is really a cultural rewriting: "C'est tout à fait vrai" or "Vous ne vous trompez pas", but which shows clearly the sememe 'confirmation of an opinion' by saying "It's quite true" or "You are not mistaken".

The sememic value 'confirmation of an action' of English emphasis is present in the sentence "He said he would sing. He sang, but not as well as one expected." "Il a dit qu'il allait chanter. Il a chanté, en effet, mais pas aussi bien qu'on s'y attendait." The French adverbial phrase "en effet" translates the sememe 'confirmation of an action' carried by the English emphasis placed on the lexeme sang.

3.5 Surprise

The English expression "Well, well if it isn't...!" shows that the sememe 'surprise' forms also a part of the sememic value of English emphasis. In this case, the French translation realizes the sememe 'surprise' carried by emphasis in English by using the lexeme surprise in the sentence: "En voilà une surprise!"

3.6 Restriction

'Restriction' shows up as a sememic element in the sentence "I said one," in which the lexeme one is emphasized. It is translated in French by "J'ai dit seulement un". The French lexeme "un" translates English "one". The adverb "seulement" renders the sememe

'restriction' of the English emphasis.

Another example of emphasis in English conveying the sememe 'restriction' is found in the following sentence: "In pre-historic times, France and England were one country": "Dans les temps préhistoriques, la France et l'Angleterre ne formaient qu'un seul pays." Here, the sememe 'restriction' is realized lexotactically in French by the negative construction "ne...que" and by the adjective "seul". The French lexeme "un" translates the English lexeme "one".

3.7 Full Understanding

In the sentence "I know you, Julia!" in which the verb carries the emphasis in English, the sememe 'full understanding' is present. The French translation "Je te connais, va, Julie!" verifies the presence of such a sememe. A word for word translation of the French would be "Come on, Julia, I know you!"

3.8 Clarification

The sentence "What have you been doing?" which is translated in French by "Je croyais que tu avais précisement passé ton temps à..." shows that English emphasis can also convey the sememe 'clarification'. By emphasizing the have, one is asking for clarification regarding what the person has been doing, since what one expected to be done was not done. The French lexeme précisement realizes lexotactically the sememe 'clarification' carried by emphasis in Engliah.

3.9 Apropos

If one says: "How is your mother" in a context where the mother happens to be mentioned, the emphasis on the verb is in English conveys the sememe 'a propos', 'by the way'. The sentence must be rendered in French by "A propos, comment va ta mère?" Here, again, the French realizes the sememe 'a propos' carried by English emphasis, by using the lexeme "à propos" in the syntactic structure.

3.10 Propulsion

The sememe 'propulsion' is conveyed by English emphasis in the sentence: "You would buy a new car" in which the would is emphasized. Without the emphasis on the "would", the same sentence would be translated in French, "Tu achèterais une nouvelle voiture." But when the "would" is emphasized, the sememe 'propulsion' is present and the sentence must be realized lexotactically in French by "Tu avais bien besoin d'acheter une nouvelle voiture" or by "Qu'est-ce qui t'a poussé à acheter une nouvelle voiture?"

3.11 Polysemic Value of Emphasis

The example used above, "What have you been doing?" shows that the same utterance with the emphasis placed on the same element, in this case the auxiliary verb "have", can express different meanings. In the sentence "What have you been doing?", the emphasized word carries the sememe 'precision' when one can paraphrase "What have you been doing (if not what you were supposed to do)".

A mother coming home to a messy house after having left her children alone for a while can say to them: "What have you been doing?" expressing her 'surprise' at such a mess by emphasizing the have of the sentence. In the first case, the emphasis asks for more 'precision'. In the second case, it expresses 'surprise'. French will say: "D'où vient ce désordre?"

3.12 Stylistic meaning

Suprasegmental phonetic emphasis in French, called "accent d'insistance" can be used on a syllable which will normally not be stressed to add stylistic meaning to an adjective. The type of meaning added is affective. For instance, "C'est formidable" which is ordinarily stressed on the last pronounced syllable, will be pronounced "c'est formidable" with the "accent d'insistance" on the first syllable to show a strong reaction to a given situation. If the adjective starts with a consonant, the "accent d'insistance" will be placed on the first syllable. If the adjective starts with a vowel, the "accent d'insistance" will be placed on the second syllable,starting with a consonant. This is the case for "c'est impeccable" and "c'est incroyable". In these cases, emphasis in French is comparable to primary stress in English, although its value is different in that, in French, it adds stylistic meaning to the element carrying the emphasis.

The stylistic meaning added by the "accent d'insistance" may also be of an intellectual nature. This occurs when two prefixes starting an adjective are strongly opposed to each other to make a point. If I say: "cet homme n'est pas immoral, il est amoral", the stylistic meaning added is intellectual and can be called 'differentiation'. Because English shows primary stress as an ordinary phonemic device in all cases, this emphasis which is called "accent d'insistance" in French is not possible in English.

4.0 Emphasis and Idiomaticity

That did it!	Alors, ça c'est le bouquet!
I know what you want!	Je te vois venir.
You would buy a new car!	Tu avais bien besoin d'acheter une nouvelle voiture.

It can be argued that emphasis in English is used in some cases to create idioms in the language. Here again, the translational approach to the study of emphasis is very revealing.

WITHOUT EMPHASIS Literal	WITH EMPHASIS Idiomatic
I know what you want. Je sais ce que tu veux.	I know what you want. Je te vois venir.
You would buy a new car. Tu achèterais une nouvelle voiture.	You would buy a new car! Tu avais bien besoin d'acheter une nouvelle voiture. Qu'est-ce qui t'a poussé à acheter une nouvelle voiture!
That did it. Cela l'a fait. (for instance, this product succeeded in gluing those two parts together.)	That did it. Alors, ça c'est le bouquet.

The French translations arrived at, in the column to the right, when one element of the English sentence is emphasized, are totally unpredictable. The meaning they convey is not at all what one would expect by adding up the lexemes which compose the utterance. They are idioms created by emphasis.

5.0 Conclusion

In translating English emphasis into French, one becomes aware of the difficulty of such an exercise.

English emphasis is suprasegmental in nature. It is handled at the phonemic and at the morphemic strata of the language system. French emphasis is segmental in nature. It is dealt with at the lexemic and at the sememic strata of the language system.

It is the identification of the exact sememe carried by English emphasis in a given context which will permit the translator to give a bonafide translation of the sentence from the source language into the target language.

Because English emphasis is suprasegmental, and is not accounted for in traditional orthography, it may often lead to ambiguity in a written text. The translator must be aware of this. If not, the translation arrived at will be faithful neither to the context nor to the text. Emphasis in French will never be ambiguous or polysemic either in spoken or in written form.

There is a convention in stratificational grammar that in moving upward from the phonemic stratum toward the sememic stratum, a progression is made from expression to content or from a more concrete plane in the direction of an abstract one. The translation of English emphasis into French, which moves in that direction, will give reason to the traditionalist belief that French is more abstract and English more concrete. Indeed, emphasis in French is always dealt with at the level of content or understanding, not at the level of expression.

Emphasis is also used in some cases to create idioms in English. This becomes evident when one translates English emphasis into French. Translation proves itself an excellent means of discovering the idiomatic value of an utterance.

As shown in this paper, the translational approach is a very adequate tool to analyse the meaning conveyed by English emphasis in a given context. The meaning conveyed by emphasis is necessary to the clarity of the message. It is hoped that the examples chosen have emphasized this enough.

NOTES

1. Quine actually intended for the home language to be the one indicating the final sameness or divergence of meaning: "...wanted are English translations, for a good way to give a meaning is to say something in the home language that has it." (p. 460) I find it more appropriate to consider emphasis in the direction of English to French because of the absence of it, nearly total, in French.

2. Wells (Structure of Meaning) relates the paradigm to the two planes of content and expression: "A paradigm...belongs to both planes. If we abstract the two planes from each other, we will split a paradigm into two parts, an E-paradigm and a C-paradigm, and then when we go on to consider the two planes in relation to each other, they will reunite the two paradigms by describing the way in which they correspond to each other." (p. 660)

3. Moreover, French is most suitably adapted in that its cases of emphasis are quite severely limited.

4. Darbelnet-Vinay speak of la mise en relief, more general than stress or intonation individually and corresponding best to emphasis: "...Elevation de la voix sur une syllabe, accentuation plus forte de cette syllabe s'accompagnant parfois de redoublement des consonnes ou d'allongement des voyelles..." (p. 207)

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THE SEMANTICS OF VERBAL COMPLEMENTS IN AMHARIC

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1. Introduction

Amharic[1], a Southern Semitic language spoken in Ethiopia, is an SOV language; the Verb[2] complex is always in the sentence-final position. The affixes added to Verbs may designate Tense, Aspect and person-number-gender agreement of Subject (and Object). This paper attempts, first, to examine the varying constructions of verbal complements in the language and second, to investigate their meanings and the factors which determine the choice of verbal complement type.

Amharic has three major types of verbal complements: the direct-quote construction, the EndE-construction and the Infinitive form. In the examples that follow, complements are set off in square brackets:

(1a) [p'awlos mEkina mE -ndat yi-cil-all-Ø] bi -yE Ø -amn -all-ohw[3] -1Sg
Paul car Inf-drive 3M-can- -3M say-1Sg 1Sg-believe-
`I believe that Paul can drive'
lit. `I believe, "Paul can drive"'

b) [p'awlos mEkina mE -ndat EndE-m-yi-cil] Ø -amn -all-ohw -1Sg
Paul car Inf-drive - -3M-can 1Sg-believe-
`I believe that Paul can drive'
`I believe that Paul will be able to drive'

c) [yE-p'awlos-En mEkina mE -ndat mE -cal] Ø -amn -all-ohw -1Sg
-Paul -Acc car Inf-drive Inf-can 1Sg-believe-
`I admit that Paul can drive'

Syntactically, the direct-quote construction requires a non-finite form of alE `say' occurring between the direct-quote clause and the matrix Verb. The direct-quote complement, like an ordinary statement, has an SOV order, and the Verb reflects Tense, Aspect and person-number-gender agreement. Without the non-finite form of alE `say' (except when the matrix Verb is alE `say' itself), the direct-quote clause and the main clause appear to be two separate sentences, as we will see later. The EndE-construction is a reduced-sentence type of verbal complement with its Verb showing only Aspect and person-number-gender agreement. The Infinitive form indicates none of the above; it is like a nominal, i.e. it can be the Subject of a sentence (e.g.

mEblat `to eat' in (2)), or it can take possessive suffixes (e.g. mEblat-u `his eating' in (3)) or carry the Accusative marker -n (e.g. mEmt'at-e-n `my eating' in (4)).

(2) mE -blat t'ru now
Inf-eat good be-Prs.3M
`Eating is good'

(3) mE -blat-u t'ru now
Inf-eat -3M.Poss good be-Prs.3M
`His eating is good'

(4) EnE mE -mt'at-e -n Ø -astaws -all-ohw
I Inf-come -1Sg.Poss-Acc 1Sg-remember- -1Sg
`I remember that I came'

To sum up, in terms of the syntactic structure, the main clause and the above-mentioned verbal complement constructions may form a continuum designating from the right end to the left a reduction of a clause into a nominal phrase:

Infinitive/ nominal	EndE- construction	direct quote with alE	two utterances

Figure 1

Given that there are three types of verbal complements, we need now to see whether Verbs in the language can take all these complement types, and, if not, what determines their choices. Let us begin with Verbs that can take direct-quote complements.

2. Cognitive Verbs

Verbs like alE `say', nEgErE `tell', awk'E `know', t'EbEk'E `expect' and asEbE `think', which most likely correspond to Givón's (1980) utterance-cognition Verb class, can take direct quotes as complements. Such verbal complements are, with respect to Time, independent of the matrix clause. There is no necessary temporal sequencing in the EVENTS described by the two clauses. Consider the following examples:

(5) [ahun EnE kek -u -n E -bEl-all-ohw] (bEl-a) alE-c -Eñ
now I cake-Def-Acc 1Sg-eat- -1Sg say-3F say-3F-1Sg
`She said to me, "I am going to eat the cake now"'

(6) [lilian kek -u -n tE-bEla-w -all-Ec] bi -yE E -
Lillian cake-Def-Acc 3F-eat -3M- -3F say-1Sg 1Sg-
nEgEr-all-ohw
tell - -1Sg
`I will tell (sb), "Lillian is going to eat the cake"'

(7) [sEw-oc-u wEfram n -accow] bi -yE Ø -awk'-all-ohw
man-Pl-Def fat be-3Pl say-1Sg 1Sg-know- -1Sg

`I have once said, "The men are fat"'

(8) [lilian kek -oc-u -n tE-bEl-all-Ec] bi -yE t'EbEk'-
Lillian cake-Pl-Def-Acc 3F-eat- -3F say-1Sg expect -
e nEbbEr
1Sg be-Past
`I expected Lillian would eat the cakes'
lit. `I expected, "Lillian will eat the cakes"'

(9) [p'awlos mEkina mE -ndat yi-cil-all-Ø] bi -yE
Paul car Inf-drive 3M-can- -3M say-1Sg
Ø -amn -all-ohw
1Sg-believe- -1Sg
`I believe that Paul can drive'
lit. `I believe, "Paul can drive"'

(10)[lilian kek -oc-u -n bElt-accow-all-Ec] bi -yE
Lillian cake-Pl-Def-Acc eat -3Pl - -3F say-1Sg
Ø -asb -all-ohw
1Sg-think- -1Sg
`I think that Lillian has eaten the cakes'
lit. `I think, "Lillian has eaten the cakes"'

As indicated in the above examples, the Verb in the complement clause can either indicate a Past or Non-Past EVENT/STATE, determined by how it is actually uttered by the person who is the matrix Subject. The Tense (Past or Non-Past) of the matrix Verb has no effect on the Verb form in the direct-quote clause. Also, we notice that these Verbs, except for alE `say', require a co-occurring non-finite form of alE `say' which codes person, number and gender of the Subject of the main clause without reflecting Tense. Without its cooccurrence, sentences are considered to be ungrammatical or sound like two separate sentences, e.g. (11-12).

(11)[ahun EnE kek -u -n E -bEl-all-ohw] [nEgEr-Ec-Eñ]
now I cake-Def-Acc 1Sg-eat- -1Sg tell -3F-1Sg
`I am eating the cake now. She told me'

(12)[sEw-yow kek -oc-u -n yi-bEl-all-Ø] [Ø -awk'-all-ohw]
man-Def cake-Pl-Def-Acc 3M-eat- -3M 1Sg-know- -1Sg
`The man is going to eat the cakes. I know'

Note that the Subject of alE `say' and that of Verbs nEgErE `tell', awk'E `know', t'EbEk'E `expect' and asEbE `think' in sentences (5-10) are the same, which is indicated by the verbal agreement. Semantically, when one knows, expects or thinks about something, he seems to say it to himself, and thus syntactically the cooccurrence of a form of alE `say', although the English gloss does not reflect the idea of `saying' except in the cases with Verbs alE `say' in (5), nEgErE `tell' in (6) and awk'E `know' in (7). Also, direct-quote complements are used for transferring information; they simply describe what is said, thought, expected, etc., showing neither any influence or effect

of the matrix Subject over the completion of EVENTS manifest by the verbal complements nor over the Subject of the embedded clauses.

In addition to the quotative complements, these cognitive Verbs can take the EndE-construction as well. Examples follow:

(13)[lilian kek -oc-u -n EndE-mE-tE-bEl-accow] t'EbEk'-
Lillian cake-Pl-Def-Acc - -3F-eat-3Pl expect -
e nEbbEr
1Sg be-Past
`I expected Lillian would eat the cakes'

(14)[p'awlos mEkina mE -ndat EndE-m-yi-cil] Ø -amn -all-ohw
Paul car Inf-drive - -3M-can 1Sg-believe- -1Sg
`I believe that Paul can drive'
`I believe that Paul will be able to drive'

(15)[lilian kek -oc-u -n EndE-bEla-c -accow] Ø -asb -all-ohw
Lillian cake-Pl-Def-Acc -eat -3F-3Pl 1Sg-believe- -1Sg
`I think that Lillian has eaten the cakes'

Syntactically, as noted earlier, the EndE-construction, unlike the direct-quote construction, is a reduced-sentence type of complement. Such constructions have no indication of Tense but do for Aspect, e.g. zero realization for Perfective in (15) and an affix like tE ⟨3F⟩ for Imperfective in (13), and the person-number-gender agreement with the embedded Subject. We will examine the use of mE more carefully later.

Semantically, (13-15) with EndE-construction complements do not mean exactly the same as (8-10) with quotative complements, although the English glosses cannot show the differences. Yet when we compare, for instance, (8) with (13), we find that if the matrix Subject (here the speaker) was more certain that the EVENT expressed by the embedded clause would be carried out (here, Lillian's eating the cake) and also if such an expectation turns out to be correct (i.e. Lillian has eaten the cake), (13) is used. Otherwise, that is, when the matrix Subject was not sure whether Lillian would eat the cake and he still does not know if she has eaten the cake, (8) is chosen. Similarly, when comparing (9) with (14), we note that when the matrix Subject (here again the speaker) is more certain about Paul's being able to drive and probably he has a reliable source concerning it, e.g. somebody has once told him that Paul drove on the street, (14) is used. This contrasts with (9) which simply presents what he believes--he has not seen Paul driving, nobody has told him anything about Paul's driving, etc., i.e. he does not have strong confidence in saying it. (10) and (15) are another pair that shows such a contrast--the speaker expresses greater CERTAINTY about the success of the EVENTS manifested by the embedded clauses. This is also why the EndE-construction is more compatible with Verbs like `believe' than with Verbs like `think' since the former shows stronger confidence on the part of the matrix Subject.

Besides the two types of verbal complements mentioned above,

the cognitive Verb class can take a third type of complement, namely, the Infinitive/nominal form. Observe:

(16)[yE-p'awlos-En mEkina mE -ndat mE -cal] Ø -amn -all-ohw
-Paul -Acc car Inf-drive Inf-can 1Sg-believe- -1Sg
`I admit that Paul can drive'

(17)[yE-lilian -En kek -oc-u -n mE -blat] Ø -asb -all-ohw
-Lillian-Acc cake-Pl-Def-Acc Inf-eat 1Sg-think- -1Sg
`I am thinking about the fact that Lillian has eaten the cakes'

Syntactically, this type of verbal complement may cooccur with the Accusative marker -n, which shows it is more like an Object (though the Verb cannot designate the agreement with it). Semantically, it is more a PARTICIPANT in the PROPOSITION manifested by the matrix clause, i.e. it is more a MENTION than an ASSERTION, which is different from the above two types of complement constructions. The English glosses given in (16-17) also show the differences between them and the previous sentences. The semantic shift of amnE from `believe' to `admit' indicates the even greater CERTAINTY of the matrix Subject about the completion of the EVENT manifested by the complement clause. The speaker, who is the matrix Subject may have seen Paul drive; so instead of choosing sentence (9) or (14), he will use (16) to express his strong confidence about Paul's being able to drive. Similarly, the meaning of asEbE is changed from `think' (or `hold an opinion,' which is less certain) in (10) to `think about' (more factual) in (17). In (17), the matrix Subject is not guessing but actually thinking about the fact that `Lillian has eaten the cakes'; he is probably worried or afraid that Lillian may be punished because of her eating the cakes. We will discuss some other sub-types of Infinitive complements later.

To sum up the present discussion, we find that in Amharic the utterance-cognition Verbs may take three types of verbal complements. The choice of which is determined by the matrix Subject's CERTAINTY about whether the EVENT expressed by the embedded clause will be (or has already been) carried out. The stronger the confidence of the matrix Subject, the more Noun-like the complement will be: Infinitive construction > EndE-construction > direct-quote construction. The Infinitive form, which is not coded for Tense, Aspect or person-number-gender agreement and hence is the most nominal one, shows the tightest syntactic relationship between the matrix clause and the complement construction. This `tightness' mirrors the `certainty' that it signals. Such a correlation can be illustrated as follows:

complement type	Infinitive construction	EndE- construction	direct-quote construction
CERTAINTY	strongest		least

Figure 2

3. Non-cognitive Verbs

Now let us examine some other types of Verbs with their complements. Consider the examples below:

(18)*[lilian mEt'-all-Ec] bi -yE Ø -astaws -all-ohw
Lillian come- -3F say-1Sg 1Sg-remember- -1Sg

(19)*[antE kek -oc-u -n tE-bEl-accow-all-Ec] bi -yE E -
you cake-Pl-Def-Acc 3F-eat-3Pl - -3F say-1Sg 1Sg-
fElEg-all-ohw
want - -1Sg

(20)*[lilian kek -oc-u -n tE-bEl-accow-all-Ec] bi -yE E -
Lillian cake-Pl-Def-Acc 3F-eat-3Pl - -3F say-1Sg 1Sg-
fEk'EdE-l-at-all-ohw
allow - -3F- -1Sg

(21)*[p'awlos kek -u -n yi-bEl-all-0] bi -yE Ø -adErEg-
Paul cake-Def-Acc 3M-eat- -3M say-1Sg 1Sg-make -
all-ohw
-1Sg

(22)*[lilian kek -oc-u -n EyE-bEla-c n -Ec] bEl-a
Lillian cake-Pl-Def-Acc IMP-eat -3F be-3F say-3F
jEmEr-all-Ec
begin- -3F

Unlike utterance-cognition Verbs, Verbs such as astawsE `remember', fElEgE `want', fEk'EdE `allow', adErEgE `make' and jEmErE `begin' cannot take direct quotes as complements. These Verbs can be sub-divided into two groups: those that can take the EndE-construction (with the connector EndE attached to the last verbal element of the embedded clauses) and those that cannot. We will examine those that can take the EndE-construction complement first. Examples follow:

(23a)[lilian EndE-mEt'a-c] Ø -astaws -all-ohw
Lillian -come -3F 1Sg-remember- -1Sg
`I remember that Lillian has come/came'

b)[lilian EndE-mE-tE-mEt'a] Ø -astaws -all-ohw
Lillian - -3F-come 1Sg-remember- -1Sg
`I remember that Lillian will come'

(24) [antE kek -oc-u -n EndE-tE-bEl-accow] E -fElEg-all-ohw
you cake-Pl-Def-Acc -2M-eat-3Pl 1Sg-want - -1Sg
`I want you to eat the cakes'

(25) [lilian kek -oc-u -n EndE-tE-bEl-accow] E -fEk'EdE-
Lillian cake-Pl-Def-Acc -3F-eat-3Pl 1Sg-allow -
l-at-all-ohw
-3F- -1Sg
`I will allow Lillian to eat the cakes'

(26) [p'awlos kek -u -n End-yi-bEla] Ø -adErg-w -all-ohw
Paul cake-Def-Acc -3M-eat 1Sg-make -3M- -1Sg
`I will make Paul eat the cake'

Comparing sentences (23-26) with (5-10), we notice that there are several differences between the complement clauses taken by these Verbs. First, the utterance-cognition Verb class (as in (5-10)) and Verb astawsE `remember' (as in (23)) and the like may have the EVENTS manifested by the embedded clauses taking place either before or after the EVENTS designated by the matrix Verbs, but the EVENTS expressed by the matrix Verbs such as fElEgE `want' in (24) and adErgE `make' in (26) must occur in real time before the EVENTS manifested by the embedded clauses. Second, even though both groups of Verbs allow their complement Verbs in the Imperfective form (indicated by the prefixes such as E- for ⟨1Sg⟩ and tE- for ⟨3F⟩), the first group (i.e. the cognitive Verbs and Verbs like astawsE `remember') requires the co-presence of mE, but Verbs like fElEgE `want' require its absence.

The different syntactic manifestations, i.e. the presence and absence of mE, can be interpreted in two ways. First, the choice of using mE or not depends on whether the STATUS of the EVENT encoded in the complement is more or less CERTAIN[4]. Consider:

(27) lilian kek -u -n tE-bEla-w -all-Ec
Lillian cake-Def-Acc 3F-eat -3M- -3F
`Lillian will eat the cake'
`Lillian is eating the cake'
`Lillian eats the cake (every day)'

Without any additional information, sentence (27) gives three readings, as shown above; hence, we consider that the EVENT `Lillian's eating the cake' is of relatively UNCERTAIN STATUS even though the PARTICIPANTS `Lillian' and `cake' are both IDENTIFIABLE. Similarly,

(28a)[lilian kek -oc-u -n EndE-mE-tE-bEl-accow] Ø -
Lillian cake-Pl-Def-Acc - -3F-eat-3Pl 1Sg-
asb -all-ohw
think- -1Sg

(28a) with the presence of mE can be interpreted either as `I think that Lillian will eat the cakes' or `I think that Lillian is eating the cakes'. Again, the STATUS of the EVENT `Lillian's eating the cakes' is less CERTAIN. Without the presence of mE, as given below,

(28b)[lilian kek -oc-u -n EndE-tE-bEl-accow] Ø -asb -all-ohw
Lillian cake-Pl-Def-Acc -3F-eat-3Pl 1Sg-think- -1Sg
`I plan so that Lillian will eat the cakes'

the EVENT `Lillian's eating the cakes' can only be interpreted as the one following the EVENT manifested by the matrix Verb asEbE;

its STATUS is relatively CERTAIN in our sense. The STATUS of the EVENT `Lillian's eating the cakes' consequently makes the matrix Verb asEbE be interpreted not as `think', but as `plan/intend' which requires its Subject to be more volitional, more manipulative. Thus, the gloss of (28b) is `I plan so that Lillian will eat the cakes'.

That the absence of mE indicates an EVENT of more CERTAIN STATUS is confirmed by the following example,

(28c)[lilian kek -oc-u -n EndE-bEla-c -accow] Ø -asb -all-ohw
Lillian cake-Pl-Def-Acc -eat -3F-3Pl 1Sg-think- -1Sg
`I think that Lillian has eaten the cakes'

Here the EVENT `Lillian's eating the cakes' is completed and its STATUS is regarded as even more CERTAIN; thus, syntactically, the absence of mE. In sum, mE can be considered to mark an EVENT of UNCERTAIN STATUS and its absence signals an EVENT of CERTAIN STATUS.

The other way to account for the presence/absence of mE is that it is determined by the semantics of matrix Verbs. The Verbs that require the absence of mE in the EndE-construction (as in (24-26)) `roughly' correspond to Givon's (1980) manipulative Verb class. Here I say `roughly' because in Amharic, Verbs like fElEgE `want' and EmmEñE `wish', though they are not manipulative Verbs, work in the same way as manipulative Verbs like adErgE `make' in the EndE-construction, i.e. they `require' the absence of mE. It seems that the determining factor in using mE or not is not exclusively that of manipulation, but includes the degree of the matrix Subject's intentional commitment toward the completion of the EVENT manifested by the complement clause. Compare the following sentences:

(29a)[lilian kek -u -n tE-bEl-all-Ec] bi -yE tEsfa
Lillian cake-Def-Acc 3F-eat- -3F say-1Sg hope
Ø -adErg-all-ohw
1Sg-make - -1Sg
`I hope that Lillian will eat the cake'
lit. `I hope, "Lillian will eat the cake"'

b)[lilian kek -u -n EndE-mE-tE-bEla-w] tEsfa
Lillian cake-Def-Acc - -3F-eat -3M hope
Ø -adErg-all-ohw
1Sg-make - -1Sg
`I hope that Lillian will eat the cake'

c)*[lilian kek -u -n EndE-tE-bEla-w] tEsfa Ø -adErg-all-ohw
Lillian cake-Def-Acc -3F-eat -3M hope 1Sg-make - -1Sg

(30a)[lilian kek -u -n tE-bEl-all-Ec] bi -yE E -mmEñ-all-ohw
Lillian cake-Def-Acc 3F-eat- -3F say-1Sg 1Sg-wish- -1Sg
`I wish that Lillian will eat the cake'
lit. `I wish, "Lillian will eat the cake"'

b)*[lilian kek -u -n EndE-mE-tE-bEla] E -mmEñ-all-ohw
Lillian cake-Def-Acc - -3F-eat 1Sg-wish- -1Sg

c)[lilian kek -u -n EndE-tE-bEla] E -mmEñ-all-ohw
Lillian cake-Def-Acc -3F-eat 1Sg-wish- -1Sg
`I wish that Lillian will eat the cake'

While both tEsfa adErgE `hope' and EmmEñE `wish' can take the direct-quote complement, in the EndE-construction complement, tEsfa adErgE `hope' requires the co-occurrence of mE ((29b) vs. (29c)), but EmmEñE `wish' does not allow its presence ((30b) vs. (30c)). The reason is because in (30c), the speaker shows his great concern and strong willfulness, though the English gloss does not reflect this well; he wants Lillian to eat the cake, for her own good. But in (29b), the matrix Subject simply has a hope; he does not show any strong concern and thus syntactically the presence of mE. In the following discussion, I will still use the term `manipulative Verbs' for those that require the absence of mE in the EndE-construction, unless the situation requires a further distinction.

These two ways of accounting for the presence of mE, i.e. whether the EVENT encoded in the complement clause is of CERTAIN STATUS and whether the matrix Subject has any manipulative force over (or has any intentional commitment toward) the completion of that EVENT, are not contradictory but compatible with each other as various implementations of STATUS. As we may expect, a person's willfulness or manipulation can be placed only on an EVENT with CERTAIN STATUS rather than on an EVENT that is UNCERTAIN. An EVENT with CERTAIN STATUS is more easily manipulated and carried out, and this explains the semantic reinterpretation of non-manipulative Verbs to manipulative ones, as shown in (28b) as well as in the following examples:

(23b)[lilian EndE-mE-tE-mEt'a] Ø -astaws -all-ohw
Lillian - -3F-come 1Sg-remember- -1Sg
`I remember that Lillian will come'

c)[lilian EndE-tE-mEt'a] Ø -astaws -all-ohw
Lillian -3F-come 1Sg-remember- -1Sg
`I will remind (sb) so that Lillian can/will come'

(31a)EnE 1E-dan [lilian kek -u -n EndE-mE-tE-bEla]
I -Don Lillian cake-Def-Acc - -3F-eat
E -nEgEr-w -all-ohw
1Sg-tell -3M- -1Sg
`I will tell Don that Lillian will eat the cake'

b)EnE 1E-dan [lilian kek -u -n EndE-tE-bEla] E -
I -Don Lillian cake-Def-Acc -3F-eat 1Sg-
nEgEr-w -all-ohw
tell -3M- -1Sg
`I will tell Don so that Lillian can eat the cake'

While utterance-cognition Verbs, as stated earlier, are used in presenting the matrix Subject's saying, knowledge, thinking, belief, expectation, etc., manipulative Verbs designate more influence/effect of their Subjects either directly or indirectly over the Subjects of the embedded clauses, which fact can be further confirmed by the following sentences:

(32)[antE-n kek -oc-u -n EndE-tE-bEl-accow] E -fElEg-
you -Acc cake-Pl-Def-Acc -2M-eat-3Pl 1Sg-want -
Eh-all-ohw
2M- -1Sg
`I am looking for you so that you can eat the cakes'

(33)[lilian -En wuha -w -n EndE-tE-t'Et'a] E -fEk'EdE-l-
Lillian-Acc water-Def-Acc -3F-drink 1Sg-allow - -
at-all-ohw
3F- -1Sg
`I will allow Lillian to drink the water'

(34)[p'awlos-En kek -u -n End-yi-bEla] Ø -adErg-w -all-ohw
Paul -Acc cake-Def-Acc -3M-eat 1Sg-make -3M- -1Sg
`I will make Paul eat the cake'

Notice that the Subject of the complement clauses may easily take the Accusative marker -n if the matrix Verb is a manipulative Verb, as in sentences (32-34). Also, the matrix Verbs will show the agreement with it in person, number and gender, as indicated by -Eh in (32), -at in (33) and -w in (34). Such syntactic manifestations (i.e. the presence of -n and the verbal agreement) designate that the Subject of manipulative Verbs is, directly or indirectly, responsible for the eventual completion of the EVENTS manifested by the complement clauses. However, this is not the case with those cognitive Verbs; thus:

(35)*[lilian -En kek -u -n EndE-mE-tE-bEla] Ø -awk'-all-ohw
Lillian-Acc cake-Def-Acc - -3F-eat 1Sg-know- -1Sg

(36)*[lilian -En kek -u -n EndE-mE-tE-bEl-accow] E -
Lillian-Acc cake-Def-Acc - -3F-eat-3Pl 1Sg-
t'EbEk'-at-all-ohw
expect -3F- -1Sg

(37)*[lilian -En kek -oc-u -n EndE-tE-bEl-accow] Ø -
Lillian-Acc cake-Pl-Def-Acc -3F-eat-3Pl 1Sg-
asb -at-all-ohw
think-3F- -1Sg

Furthermore, since the Subject of the manipulative Verbs is more responsible for the completion of the EVENT encoded in the complement clause, he should be relatively more certain about the successful completion of that EVENT, which explains why such Verbs do not take the direct-quote complement but the EndE-construction.

From the preceding discussion, we may conclude that mE is a marker indicating an EVENT of UNCERTAIN STATUS and is then re-interpreted as designating the lack of the matrix Subject's intentional commitment toward (or influence/CONTROL over) the completion of the EVENT encoded in the complement clause.

In addition to the EndE-construction, some manipulative Verbs may take Infinitives as their complements, while some cannot, which is again determined by the verbal semantics. Consider the sentences below:

(38)[yE-antE-n kek -oc-u -n mE -blat] E -fElEg-all-ohw
-you -Acc cake-Pl-Def-Acc Inf-eat 1Sg-want - -1Sg
`I want you to eat the cakes'

(39)[yE-lilian -En kek -oc-u -n mE -blat] E -fEk'Ed-all-ohw
-Lillian-Acc cake-Pl-Def-Acc Inf-eat 1Sg-allow - -1Sg
`I allow Lillian to eat the cakes'

(40)*[yE-p'awlos-En kek -u -n mE -blat] Ø -adErg-all-ohw
-Paul -Acc cake-Def-Acc Inf-eat 1Sg-make - -1Sg

While the Verb adErgE `make' in (40) gives a more forceful and manipulative sense, i.e. its Subject has greater CONTROL over the Subject of the embedded clause, Verbs like fElEgE `want' in (38) and fEk'EdE `allow' in (39) designate a permissive or intentional sense of manipulation, and may indicate their Subject's influence either over the Subject of the complement clause or over the completion of the EVENT expressed by the embedded clause. Consequently, while adErgE `make' can only take the EndE-construction complement to show its Subject/Agent's forcefulness over the Subject of the complement clause, Verbs like fElEgE `want' and fEk'EdE `allow' may have a whole PROPOSITION (which includes both PARTICIPANT(S) and EVENT) functioning as the complement and being treated as a PARTICIPANT in the matrix PROPOSITION; it is a MENTION instead of an ASSERTION. Syntactically, this type of complement takes the Accusative marker -n and is manifested by a nominal structure, such as yE-lilian-En kek-oc-u-n mEblat `Lillian's eating the cakes' in (39).

The claim that this Infinitive complement manifests a whole PROPOSITION and serves as a PARTICIPANT in a larger domain, i.e. the matrix PROPOSITION, can also be supported by the following:

(41a)[yE-antE mEkina-w -n mE -ndat] k'oc't-o -ñ -all
-you car -Def-Acc Inf-drive regret-3M-1Sg-
`I regret your having driven the car'
lit. `Your having driven the car is regretful to me'

b)*[antE mEkina-w -n EndE-nEdat-Eh] k'oc't-o -ñ -all
you car -Def-Acc -drive-2M regret-3M-1Sg-

While in (41a) yE-antE mEkina-w-n mEndat `your driving the car' can serve as the Subject, indicated by the verbal agreement o ⟨3M⟩, the EndE-construction in (41b) cannot. Moreover, this

claim may help explain why in sentences with cognitive Verbs, when the matrix Subject is more certain about the completion of the EVENT encoded in the complement structure, the Infinitive/ nominal form is chosen, e.g. (16-17). Since what is believed/ admitted (as in (16)) or what is thought about (as in (17)) is the domain of the whole PROPOSITION expressed by the nominal complement, instead of the Subject/PARTICIPANT or the EVENT of the embedded clause, the degree of the matrix Subject's CERTAINTY about the completion of the EVENT expressed by the complement is greater in the sentences with nominal complements than those with EndE-construction complements.

The Infinitive/nominal complement is not limited to the above-mentioned type, i.e. the yE- form; there are two other types which require our further examination, namely, the possessive-suffix type and the plain Infinitive type. First, consider the possessive-suffix type as in (42b):

(42a)[yE-lilian -En kek -u -n mE -blat] fEk'Ej-e nEbbEr
-Lillian-Acc cake-Def-Acc Inf-eat allow -1Sg be-Past
`I allowed Lillian's eating the cake'

b)[lilian kek -u -n mE -blat-wa -n] fEk'Ej-e nEbbEr
Lillian cake-Def-Acc Inf-eat -3F.Poss-Acc allow -1Sg be-Past
`I allowed Lillian's eating the cake'

Although the English glosses given in (42a) and (42b) are the same, these two sentences are not exactly identical in meaning, which will become clear when we compare the sentences below:

(43a)[yE-lilian -En Enji yE-dan-En kek -u -n mE -blat]
-Lillian-Acc but -Don-Acc cake-Def-Acc Inf-eat
al -fEk'Ed-kw -m
Neg-allow -1Sg-Neg
`I allowed Lillian's eating the cake, not Don's'

b)[lilian kek -u -n mE -blat-wa -n Enji mE -
Lillian cake-Def-Acc Inf-eat -3F.Poss-Acc but Inf-
c'awEt-wa -n] al -fEk'Ed-kw -m
play -3F.Poss-Acc Neg-allow -1Sg-Neg
`I allowed Lillian's eating the cake, not playing'

Apparently, the yE-type is used when the PARTICIPANT--the complement Subject--is the FOCUS, e.g. (43a), whereas the possessive-suffix form is used when the EVENT is the FOCUS, e.g. (43b).

Next, consider some sentences with plain Infinitive complements:

(44a)[kek -oc-u -n mE -blat-e -n] Ø -amn -all-ohw
cake-Pl-Def-Acc Inf-eat -1Sg.Poss-Acc 1Sg-believe- -1Sg
`I admit that I have eaten the cakes'

b)*[kek -oc-u -n mE -blat] Ø -amn -all-ohw
cake-Pl-Def-Acc Inf-eat 1Sg-believe- -1Sg

(45a)[yE-bet sEra mE -sřat-e -n] ErEsa -whw
-house:work Inf-work-1Sg.Poss-Acc forget-1Sg
`I forgot that I had done my homework'

b)[yE-bet sEra-e -n mE -sřat] ErEsa -whw
-house:work-1Sg.Poss-Acc Inf-work forget-1Sg
`I forgot to do my homework'

(46a)*[yE-bet sEra-e -n mE -sřat-e -n]
-house:work-1Sg.Poss-Acc Inf-work-1Sg.Poss-Acc
E -fElEg-all-ohw
1Sg-want - -1Sg

b)[yE-bet sEra-e -n mE -sřat] E -fElEg-all-ohw
-house:work-1Sg.Poss-Acc Inf-work 1Sg-want - -1Sg
`I want to do my homework'

Here, we note that non-manipulative Verbs like amnE `believe' require the possessive-suffix to be present in the Infinitive complement which designates a completed EVENT, e.g. (44a). Manipulative Verbs like fElEgE `want' need its absence, i.e. they take the plain Infinitive complement, and the Infinitive complement indicates an un-actualized ACTION, e.g. (46b). Other Verbs like ErEsa `forget' allow either its presence or absence, which denote different meanings, e.g. an actualized ACTION in (45a), or an unactualized ACTION in (45b). The contrast shown here confirms our earlier postulation, i.e. without additional information, mE is used when an EVENT of relatively less CERTAIN STATUS is referred to. More examples are given below:

(47) m-ac'Es al -Ø -fEk'd-Em
-smoke Neg-1Sg-allow-Neg
`I do not allow smoking'

(48) m-ac'Es al -Ø -wEd -Em
-smoke Neg-1Sg-like-Neg
`I do not like smoking'

Here the Subject/Agent of `smoking' can be either the matrix Subject, i.e. `I', or anybody else, and the ACTION of `smoking' does not refer to a particular EVENT but `smoking' in general. As expected, the EVENT/Verb `smoking' is indicated by mE without any possessive suffixes and requires the absence of the Accusative marker -n.

There are some other Verbs, such as jEmErE `begin' and c'arEsE `finish', that in the matrix clause always require the Subjects of both the matrix clause and the verbal complement to be coreferential. These Verbs neither take the direct-quote nor the EndE-construction complements; they can take only the Infinitive type of complement, either with or without possessive suffixes. Examples follow:

(49a) [lilian kek -oc-u -n mE-blat-wa -n] jEmEr-all-Ec
Lillian cake-Pl-Def-Acc -eat -3F.Poss-Acc begin- -3F
`Lillian has begun to eat the cakes'

b) [lilian kek -oc-u -n mE-blat] jEmEr-all-Ec
Lillian cake-Pl-Def-Acc -eat begin- -3F
`Lillian has begun to eat the cakes'

(50a) [lilian kek -u -n mE-blat-wa -n] c'arEs-all-Ec
Lillian cake-Def-Acc -eat -3F.Poss-Acc finish- -3F
`Lillian has finished eating the cake'

b) [lilian kek -u -n mE-blat] c'arEs-all-Ec
Lillian cake-Def-Acc -eat finish- -3F
`Lillian has finished eating the cake'

The reason for the presence of the possessive suffix wa in the Infinitive complement in (49a) and (50a), and for its absence in (49b) and (50b) may be a pragmatic one--if the EVENT `Lillian's eating the cake' has been mentioned before, it is relatively more CERTAIN and hence the presence of wa; otherwise, it is absent. This needs further study.

4. Conclusion

Givón (1980), in studying the formation of verbal complements in some languages, classifies Verbs into three types--manipulative, modality and cognition-utterance Verbs--and postuates that there exist systematic correlations between the verbal semantics and the syntactic structures of verbal complements cross-linguistically. Givón's hypothesis is an interesting one; however, as Davis (Ms.9) points out, "Givón's `binding hierarchy' is a demonstration of the power of EVENT semantics in the formation (of complement sentences, LMH), but it ignores the possibility that the semantics of PROPOSITIONS (as the semantics of PARTICIPANTS) can operate to determine the nature of the `complement sentence' relation..." The `binding hierarchy' can not be the sole parameter that determines the construction of verbal complements; some other factors (which may vary from language to language) need to be included as well.

Amharic is a language that requires more than one parameter in choosing the verbal complements, as demonstrated in the above discussion. The language shows that verbal semantics is one of the determining factors with respect to the formation of verbal complements. While both jEmErE `begin'-like Verbs and adErgE `make'-like Verbs can take only one type, i.e. the Infinitive form and the EndE-construction, respectively, most non-cognitive Verbs have two types and cognitive Verbs three, as shown in Figure 3.

	Infinitive	EndE-	Quotative
non-cognitive:			
`begin' like	x		
`make' like		x	
others	x	x	
cognitive:	x	x	x

Figure 3

MOOD or the degree of the matrix Subject's CERTAINTY about the completion of the EVENT manifest by the complement also plays a role in choosing the complement type: the stronger CERTAINTY the matrix Subject has, the more nominal the form of complement is used, as illustrated in Figure 4.

Infinitive	EndE-	Quotative
strongest CERTAINTY		least CERTAINTY

Figure 4

In addition, the completion along with the STATUS of the EVENT encoded in the complement is another factor, which accounts for the occurrence of mE in the EndE-construction and the possessive suffix in the Infinitive complement. This relationship is shown below:

	Infinitive	EndE-
CERTAIN STATUS	possessive-suffix	Ø
UNCERTAIN STATUS	Ø	mE

Figure 5

Finally, the notion of FOCUS also determines which sub-type of Infinitive complement to use--if the Subject of the complement is the FOCUS, the yE- type is used; and if the EVENT itself is the FOCUS, the possessive-suffix type is then chosen.

To sum up, Amharic constructions with verbal complements are determined by many factors. This is true of all languages and any attempt to set up a universal rule to account for these and any other constructions must almost certainly fail.

Footnotes

1

All Amharic data given here are provided by Chanyalew Bekele, a native speaker of Amharic, to whom we are very grateful

for his sharing his language with us. Financial support for this project has been provided by the Department of Linguistics, Rice University. Also, I would like to thank Mr. Gasser for his comments on my data transcription and Dr. Philip Davis, who has given me many valuable suggestions about this paper. Any mistakes in this paper are mine.

2

Notionally we shall use upper case (e.g. EVENT) to indicate a semantic category, and an initial upper case (e.g. Tense) to indicate a grammatical term.

3

The symbols [E, c, j] in this paper stand for [ə], [č] and [ǰ] respectively. And the abbreviations used are as follows:

Acc : Accusative
Def : Definiteness
IMP : Imperfective
Past: Past Tense
Pl : Plural
Poss: Possessive
Prs : Present Tense
1Sg : the first person singular
2M : the second person, singular, masculine
3M : the third person, singular, masculine
3F : the third person, singular, feminine

4

`STATUS' is used here in the sense of Foley and Van Valin (1984.213), who taking the distinction from Whorf, describe it as `the variable of actuality of the event, whether it has been realized or not.' This contrasts with CERTAINTY above, which represents values of MOOD. That is, `the relation between the narrated event and its participants with reference to the participants of the speech event' (Jakobson 1971.135). We will see below that both MOOD and STATUS are independently relevant to understanding verbal complements in Amharic.

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SIX TROUBLESOME SYNONYMS

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0. INTRODUCTION

0.1 Synonymy

After the oral presentation of Backlund 1985 there was a discussion about whether true synonymy exists. This is but one token of a continuing discussion that has its roots in antiquity. Even though dialogue at LACUS is less acrimonious and more productive than at other societies of my acquaintance, our debate was truncated by time limitations, leaving several questions unresolved. Of these the most pressing concerns the persistence of the argument itself. Backlund has given many examples in which a close lexical analysis proves conclusively that there is a minimal but semantically important difference between presumably synonymous pairs like *quick* and *rapid*. The clearest examples of such differences can be found in fixed collocations: though *big* and *large* are nearly true synonyms in the sense of universal substitutability, *my big sister* is not necessarily *my large sister*. Discrepancies like this used to be explained by resorting to idiomaticity. But given the logically precise definition of an idiom presented in Makkai 1972, it can be shown that context and not idiomaticity explains most fixed collocations (cf. Ruhl 1985).[1]

Thus the case against full synonymy seems to be as conclusive as possible, barring a pair-wise comparison of each set of possible synonyms in every human language. The belief in synonymy is due partly to convenience, e.g. in definitions, and partly to a more general phenomenon. That is, proving the existence of something only requires that a single example be produced. But proving its non-existence is often held to be impossible in the strict sense. I hold that this is at least approachable, though it requires that the nonexistent phenomenon be well understood and defined in a logically airtight fashion. Thus, in order to disprove the existence of synonymy, I must first detail its logical nature.

0.2. The Logical Nature of Synonymy

It is convenient to define synonymy in terms of substitutability. That is, if two words have meanings such that everywhere one occurs, the other can be substituted without modifying the meaning of the greater context, they are said to be synonyms with the same meaning. In logic, "the same meaning" implies that the two have only one meaning. The meaning of *word1* in figure 1 is the meaning of *word2*. The semantic identity of *word1* and *word2* means that in any given context *word2* is as likely as *word1*. That is, 'the MEANING' can be communicated by EITHER *word1* OR *word2*; in

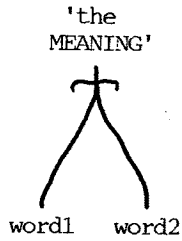


Figure 1

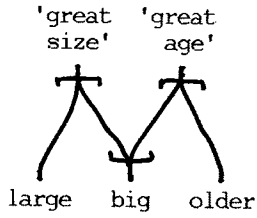


Figure 2

essence, both *word1* and *word2* are related to 'the MEANING', and the relation between them is an OR relation. All of this is included in figure 1, which suggests both synonymy and free variation. As soon as the free variation between *word1* and *word2* is restricted, as for *big* and *large* in the context *my* ___ *sister*,[2] it is no longer a case of simple synonymy. It is a combination of synonymy with polysemy, as shown in figure 2. Positing polysemous *big* as *big1* (= *large*) and *big2* (= *older*) is no help, either. The two are phonetically identical and must neutralize above the phonology. Thus *big1* and *big2* would only be labels for the lines above the upward OR in figure 2, and the attempt would have failed: figure 2 remains logically unmodified. But figure 2 does not have an instance of full or true synonymy.

From a Jakobsonian point of view, full synonymy holds between two phonetic forms that share the same *Gesamtbedeutung(en)*, a situation which parallels the diagram in figure 1. Partial synonymy would be exhibited by two phonetic forms that share a *Gesamtbedeutung* while at least one of the two is related to other *Gesamtbedeutung(en)*. This is a deceptively simple statement to make, but no hint of the logic underlying it is present in figure 2. Still, the logic of "partial" synonymy can be presented in explicit detail, and I return to this question in section III below. But doing this requires a problem in natural language. There is such a problem in the description of Russian locus expressions, to which I now turn.

0.3 Six Ways to Say 'Near'

There are six Russian prepositions which can be translated as 'near': *vozle, bliz, okolo, vblizi, podle,* and *u*. Pul'kina says flatly (1977:103) that *vozle, bliz,* and *okolo* are full synonyms meaning 'near, close to'. Each of the other three may in certain contexts be synonymous with (= substitutable for) one of the first three at least, and dictionaries define each of the six in terms of at least one of the other five. For example, if *podle* can be defined as *vozle*, and if *vozle* is a full synonym to *bliz*, is *podle* also definable as *bliz*? Whatever the answer to this question, it is clear that the six are similar.

At the same time, full synonymy requires free substitutability among all six, and a case of six-way free variation would be unique. There are, however, contexts in which some of the six do not occur, and though we cannot ignore the possibility of an "idi-

om" explanation without close examination, it will prove impossible to support a claim of full synonymy. But the substitutability in some contexts demonstrates a relationship which I refer to as 'overlap'.[3] In short, there are two things which must be accounted for in these six Russian prepositions: their overlap (or partial substitutability) and their distinctness.

I. THE ANALYSIS OF SIX "SYNONYMS"

I approach this analysis in two parts, considering first the overlap between the prepositions and then the distinction between them.

I.1 The Overlap

The assumption of this entire study is that overlap is a result of shared function(s). In those contexts where the shared sememic roles are crucial and any distinguishing roles can be ignored, any of the overlapping prepositions can appear. The text in (1) has such a context.[4] According to the unprompted and in-

(1) *Kogda my proezžali mimo stancii kreslo upalo s gruzovika. Nikto ničego ne zametil i ono sejčas ležit na ulice* _____ *stancii.*

When we were driving past the station a chair fell off the truck. But nobody noticed anything and it is now lying in the street <u>near</u> the station.

formal judgement of several native speakers, any of the prepositions except *podle* fits in (1).[5] In any case I consider the anomaly in the distribution of *podle* below. At this point I remark only that *podle* is substitutable in some contexts.

The possible appropriateness of any of the six in the context in (1) suggests that all of these prepositions are related to the sememic roles LOCUS and PROXIMATE. These two roles alone explain the physical relation between station and chair. The overlap is thus accounted for. I turn now to a consideration of the differences.

I.2 The Distinction

The six prepositions are formally distinct from each other, despite certain similarities. I assume that the formal distinctions realize different sememic roles. Specifically, these sememic roles are drawn from the inventory of geometric roles (INTERIOR, LATUS, ANTERIOR, INFERIOR, etc.).

Now the empirical justification of this assumption is not so easy. By using independently motivated geometric roles which correspond to the morphemic form of these six prepositions, I can easily produce a description which distinguishes minimally between any pair of them and is structurally straight-forward. But I do so in hypothetical fashion. That is, what I formulate below as a description is in reality only a set of interlocking hypotheses. They make a number of empirical claims about the ways these prepo-

sitions can be used, and those claims should be tested in several ways before my description is fully acceptable. That is, spontaneously produced texts should be searched for the distribution of the prepositions, several kinds of psycholinguistic tests should be run on native speakers, and the order of acquisition of these prepositions in children should be determined for both understanding and production. My description should then be adjusted as necessary in the light of the empirical findings. However, I do not have access to the number of native speakers I would need to run such tests, and the experiments are therefore left to subsequent research. Instead, I simply state the conclusions I can draw from standard reference sources and ordinary narrative texts (popular fiction) which are available to me.[6] I turn first to *okolo*.

By its (etymological) morphology, *okolo* should mean something like 'against the wheel'. It can, in fact, often be translated as 'around' or 'about'. Some typical examples are given in (2) from P1977:109. The normal locus usage appears in (2a), which shows

(2) a. *Samolët opustilsja okolo lesa.*
The airplane set down near a forest.
b. *My prošli okolo pjati kilometrov.*
We covered about five kilometers.

that *okolo* is indeed related to LOCUS and PROXIMATE. A forest has no fixed geometric characteristics, and the only thing known about the location of the plane relative to the forest is that the forest is within walking distance of the plane. The plane could be at any compass direction with reference to the forest, which suggests that no further specification of geometric roles is needed for *okolo*. (I return to this question in the discussion of *vozle*.) The metaphorical usage in (2b) is compatible with the spatial usage in (2a), in that the walkers could have gone a little more than 5 km or a little less. However, *okolo* in (2b) is not substitutable by any of the other five prepositions. This is powerful evidence against an assumption of full synonymy and against adding further geometric roles to the specification of *okolo*. The 'five kilometers' mentioned is a (one-dimensional) extent. None of the three-dimensional geometric roles which have to be added to the sememic specification of the other prepositions is appropriate to it, and the combination LOCUS and PROXIMATE suffices by itself.

Now consider *vozle*, which is supposedly fully synonymous to *okolo*. *Vozle* could be substituted into (2a) without affecting the meaning, but it cannot be substituted into (2b). By itself, this suggests either an idiomatic usage or a difference in meaning or function between *okolo* and *vozle*. No claim of idiomaticity will hold up in the face of the predictable meaning of *okolo* in (2b) and the productivity of this usage. Furthermore, examining the difference between (3a) and (3b) shows that there is a difference

(3) a. *Nikita stojal okolo otca.*
Nikita was standing near his father.
b. *Nikita stojal vozle otca.*
Nikita was standing beside his father.

in meaning between *vozle* and *okolo*. In (3a) Nikita is somewhere near his father, but there are no other restrictions on his location relative to his father. In (3b) he is just as close to his

father, but to one side or the other, rather than to the front or rear. This suggests that *vozle* is marked for the geometric role LATUS (= side).

Now the occurrence of LATUS with *vozle* but not *okolo* accounts for the difference in meaning between (3a) and (3b). But whether LATUS is specified in (2a) is irrelevant. Our knowledge of the geometry of an area in which a forest grows and a plane can land tells us that the plane must be on the same vertical level as the forest rather than above or below it and not in among the trees. The lack of fixed dimensions for the forest prevents LATUS from communicating 'side' as opposed to 'front' or 'back'. Still, 'side' is not wrong or inconsistent with the situation, so *vozle* is possible. Thus both distinction and overlap are accounted for.

Next consider *bliz*. *Bliz* is also supposed to be a full synonym of *okolo* and is certainly very close to it in meaning. Substitution of *bliz* into (2a) or (3a) (or even into [5a] below) does not affect the meaning. However, there are two indications of the way in which *bliz* differs from *okolo* semantically. First, derivatives of *bliz* are like *blizit'sja* 'draw near', *blizost'* 'intimacy' and *blizorukij* 'myopic'. All of them, whether concrete or metaphorical, refer to proximity. Conversely, words derived from *okolo* are like *okolyš* 'cap-band'. The proximity is implicit, derived only from our knowledge of caps, and was originally secondary to the circularity. But these considerations are of basically etymological or historical interest. More important for our purposes is the fact that *bliz* usually occurs with objects which are fixed in space, e.g. *dom bliz parka* 'a house near the park' or *gorodok bliz berega* 'town near the shore'. The communication of a permanent location suggests that *bliz* is related to a geometric role. However, *bliz* is not limited to the side(s), as are *vozle* and *podle*, or to the front or rear, as are *vperedi* and *vzadi*. That is, substituting *bliz* into (3b) would produce a grammatical sentence which tells nothing about the relative position of father and son. I therefore assign the non-specific geometric role PART to *bliz*.

The discussion concerning distinction and substitutability regarding *okolo* and *vozle* could be repeated here with insignificant modifications. All the same considerations apply, and both eventualities are accounted for.

The next preposition, *vblizi* 'in the vicinity of', is related to *bliz* in both form and meaning.[7] Assuming that the differences between them parallel the meaning of *v* + loc, I relate *vblizi* to the sememic role INTERIOR to distinguish it from *bliz*. This suggests that *vblizi* defines a locus which is interior to a part of the proximity of the object.

Next consider *podle*, which is defined as 'by the side of'. It is nearly synonymous to *vozle* in geometric terms. Some typical examples of its use in context are given in (4). (4a) is taken

(4) a. *Otec sidel za pis'mennym stolom. On sklonilsja nad tetradju i Nikita ... stojal podle nego.*
Father was sitting at the writing desk. He was bent over a notebook and Nikita ... was standing at his elbow.

b. *Podle stola stojal stul.*

By the side of the table stood a chair.

c. *Ona sela podle nego.*
She sat down beside him.

from Uspenskaya (nd:33); (4b and 4c) are from Smirnitsky (1958). Each of these examples could use the preposition *vozle* without altering the physical locus communicated, but something else would change. In (4) all the words modified by *podle* phrases are beside and subordinate to the object of *podle*. In (4a) Nikita is waiting while his father reviews his literature homework. Nikita, otherwise an excellent student, is not good in literature and depends on his father's help; he is thus functionally subordinate to him. In (4b) the fact that the chair is part of a set with the table and projects underneath it gives it positional subordinacy. In (4c) she gains temporal subordinacy by sitting down after he was already sitting there. With *vozle* (cf. [3b]) the subordinacy is lacking. I therefore relate *podle* to the same roles as *vozle*, adding only the geometric role INFERIOR, which the syllable *pod* suggests (cf. Sullivan 1986).

This role assignment describes the functions of *podle* in relation to the near synonyms. But it also predicts the inappropriateness of *podle* in (1), where the relationship of the chair to the station is simply accidental. The speakers who rejected *podle* evidently did not consider that the chair and the station formed a pair; hence, no precedence relation was expressed.

Finally, consider *u*. A sample of its usages is given in (5) (P1977:113-14). The usage in (5a) is "synonymous to usages with

(5) a. *Mašina ostanovilas' u doma.*
The car stopped by the house.

b. *Ja byl u vrača.*
I was at the doctor's.

c. *U brata krasivyj golos.*
My brother has a beautiful voice.

d. *Ja polučil u tovarišča knigu.*
I got a book from a friend.

vozle, *vblizi*, and *okolo*" (P1977:113). The usage in (5b) is the normal locus expression for human objects and is consistent with (5a). The two other normal locus expressions, *v* and *na*, communicate position within and on the surface of the object. Neither is appropriate to the relative locus of two people in normal circumstances, but proximity is perfectly reasonable. This usage is metaphorical in the sense that *vrača*, which refers to a person, is used as a metaphor for a place, the doctor's office. The usage in (5c), however, is a fully metaphorical application of *u*. It is also the only way to say 'I have (≠ I possess, I own)' in Russian, as the verb with this meaning was lost. The usage in (5d) is normally called a source or origin usage (P1977: 113). However, *u* differs from the true source expressions (e.g. *ot*, *s*). They refer to a source in any the context, even in the absence of a verb of motion. To the contrary, *u* only operates as a source in the context of a verb signifying removal. Therefore the source inference is implicit in the context, and *u* in (5d) can be treated as the same locus expression that appears metaphorically in (5b) and (5c). There is one more difference between (5d) as it appears

with *u* and as it would appear with *ot*. In the former case, the speaker got the book from his friend in person; in the latter case it was sent to him, e.g. through the mails or via a third person.

Insofar as *u* differs from *okolo* and *bliz*, it does so in the sense that the locus is more rigidly fixed, even though not definable in terms of dimensions. Therefore, I simply mark *u* for the role POINT.

I.3 Summary of the Analysis

A summary of the sememic role assignments for the six synonymous prepositions is given in table 1.

Table 1: Componential analysis of six synonyms

Prep	LOC	PRX	PRT	INT	LAT	INF	PNT
okolo	+	+					
bliz	+	+	+				
vblizi	+	+	+	+			
vozle	+	+			+		
podle	+	+			+	+	
u	+	+					+

I.4 Discussion

In Jakobsonian markedness theory, there are two predictions relevant to the description in table 1 which must be discussed. The predictions are consequences of the observation that additional marks both specify and restrict a morpheme relative to a morpheme with fewer marks. That is, *okolo* is related to only two roles; all the the rest are related to three and four. Jakobsonian markedness theory predicts that *bliz*, for example, being more highly marked than *okolo*, should occur less frequently, in fewer contexts, and should be acquired later. It is indeed less frequent than *okolo* in the short texts I researched. But I leave the full verification of the inferences to subsequent research.

The above comments apply with even more force to *vblizi*, especially in relation to *bliz*, and to *podle* in relation to *vozle*, but the hypothesis is still likely to be valid.

Where I foresee a problem is with the preposition *u*. I suspect that *u* is both more frequent than any of other five and that it is acquired earlier. At first glance, this is contradictory to the predictions of Jakobsonian markedness theory. In fact, however, most of the occurrences of *u* are accounted for by usages like those of (5c), repeated here for convenience as (6a). Now (6a)

(6) a. *U brata krasivyj golos.*
My brother has a beautiful voice.

b. *U brata krasivyj kabinet.*
My brother has a beautiful office.
OR
At my brother's house there's a beautiful office.

is called "a metaphorical usage" above, but that is a misleading label. That is, of course, its historical source. But this is in reality a true case of idiomaticity in the contemporary langauge. Consider (6b). Without further context it is impossible to choose

between the two interpretations given. Each is perfectly reasonable and fully grammatical. But one is simply a locus usage while the other communicates possession without saying anything about locus. Without going into the logical details, I will simply say that it fulfills the requirements Makkai enunciated for idiomaticity. (6a) does not display similar ambiguity because a voice is not a concrete object which can have a location separate from its owner. But this inference can be drawn on the basis of what we know about voices. It owes nothing to the grammar of Russian.

Assuming that (6a) (= [5c]) is idiomatic and not a locus expression at all, the problem is cleared up. When we subtract the possession usages from all the occurrences of *u*, only locus usages are left. If restricted to locus usages, *u* does not violate the predictions of Jakobsonian markedness theory. Locus usages of *u* are indeed less frequent than the usages of *okolo*, and *u* is most likely acquired later in its locus incarnation.

Now the above argument does not revoke the need for psycholinguistic research to verify these claims empirically, and I repeat my caveat in that direction. But apart from that, the analysis of this set of prepositions is complete. The six prepositions are described uniquely, and their overlap is accounted for.

II. THE DESCRIPTION

A complete description of any linguistic phenomenon must include a full specification of the relationships underlying it. Table 1 is only a symbolic summary of the analysis in section I and leaves more unsaid than it says. The relationships underlying table 1 include two sets of structural relations and the semiotic relations connecting them. First is a generalized statement of sememic structure, in which the cooccurrence restrictions on the sememic roles are stated. Then there must be a statement of the relevant portions of the grammatical structure of prepositional phrases. Finally, there must be a full statement of the semolexemic realizational relations which interconnect the sememic structure with the syntactic. This will account for the possible sememic role complexes and the preposition-case pairings by which they are communicated. I begin with the description of sememic structure.

II.1 The Structural Relations

Underlying the componential analysis of table 1 is a set of relations in sememic structure. A unified description of these relations is given in (7), where SS stands for 'six synonyms'.

(7) SS//LOC & PRX & [(PRT & [INT]),(LAT & [INF]),PNT]

As the syntax of prepositional phrases in Russian is not significantly different in principle from that of English, I do not present them here.

II.2 The Semiotic Relations

There are six semiotic relations which relate the structural

complexes defined in (7) to preposition-case pairings. These relations are detailed in (8).

(8)
a. LOC & PRX :: *okolo* + gen
b. LOC & PRX & PRT :: *bliz* + gen
c. LOC & PRX & PRT & INT :: *vblizi* + gen
d. LOC & PRX & LAT :: *vozle* + gen
e. LOC & PRX & LAT & INF :: *podle* + gen
f. LOC & PRX & PNT :: *u* + gen

The semiotic relations detailed in (8) can be described more efficiently. Such a description is given in the realizational algorithm given in table 2, where the cooccurrence restrictions implicit in (8) are exploited fully. The occurrence of LOC and PRX are entry conditions for the algorithm.

Table 2: A realizational algorithm for the six "synonyms"

	INPUT	OUTPUT	GOTO
1)	LOC		3
2)			end
3)	PRX		5
4)			end
5)	PRT		7
6)			9
7)	INT	*v-...-i*	
8)		*bliz*	15
9)	LAT	*...le*	11
10)			13
11)	INF	*pod*	15
12)		*voz*	15
13)	PNT	*u*	15
14)		*okolo*	
15)		gen	end

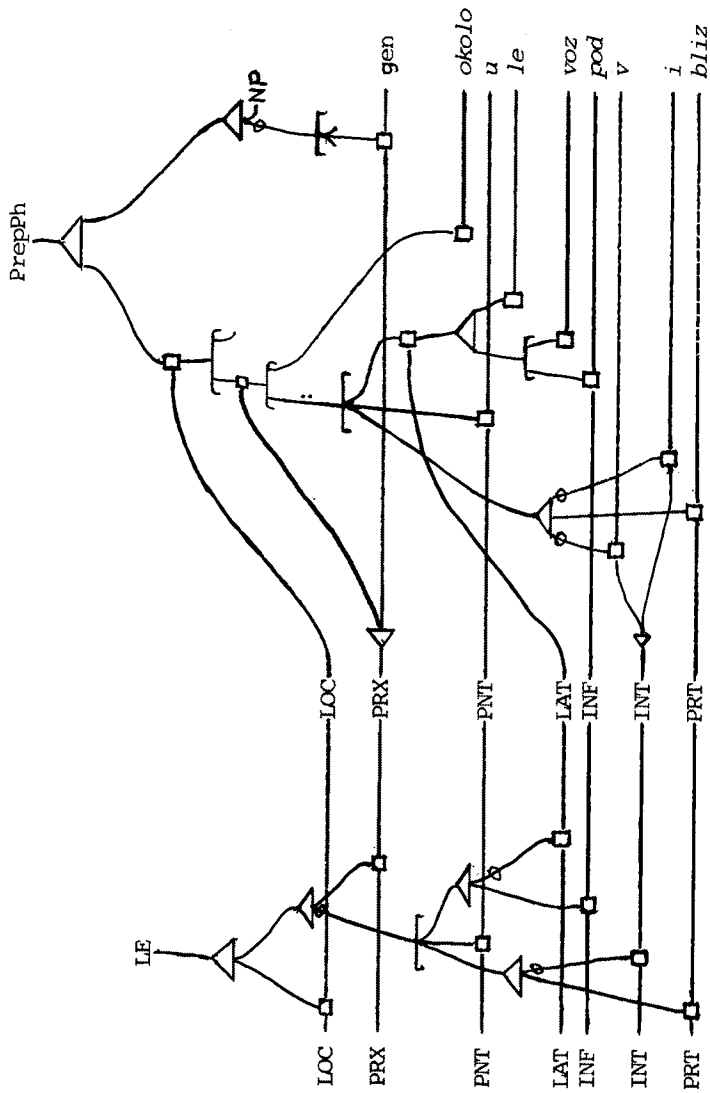
II.3 An Integrated Description

As mentioned above, a complete description of any linguistic phenomenon accounts for all the relationships underlying that phenomenon. Effecting this requires an explicitly formulated theory of language which permits a complete modeling of language and does not arbitrarily truncate or distort those portions of language inconvenient to the model or the theory. I believe that the six synonyms in questions here can be described in Tagmemic or Systemic theories, but I restrict my formalized description to the rela-relational network model of stratificational theory.

The full relational network description of the six prepositions considered above is given in figure 3 on the next page. The sememic structure is on the left, the syntactic structure is on the right, and the realizational relations connect them.

III. SYNONYMY RECONSIDERED

The description in figure 3 clearly shows that both the distinctions between the six prepositions and their overlap are accounted for. The overlap comprises the sememic roles LOCUS and


PrepPh
NP
gen
okolo
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le
voz
pod
v
i
bliz
LE
LOC
PRX
PNT
LAT
INF
INT
PRT
LOC
PRX
PNT
LAT
INF
INT
PRT

Figure 3

PROXIMATE, which all the preposition-case pairings considered have in common. The occurrence of LOCUS evokes a preposition; PROXIMATE evokes a preposition of this set and the genitive case. No matter whether any other sememic role is present, genitive case and a preposition of this set are required, and a locus in the proximitiy of the object is communicated. This explains why any of the six can be translated as 'near'.

Conversely, if no sememic role in addition to LOCUS and PROXIMATE is present, *okolo* is produced. If an additional role is present, the identity of that role determines which preposition occurs. This accounts for all distinctions.

The description of synonymy given above parallels a Jakobsonian treatment of the phenomenon. But the stratificational description is fully generalized. LOCUS and PROXIMATE get six separate plus marks in table 1. In figure 3 LOCUS and PROXIMATE occur only once each, but in dominant positions at the top of the sememic structure.

At the same time, the description in figure 3 supports the conclusion that no two of these prepositions are "full" synonyms, despite the overlap and the insistence of the experts (Pul'kina, AD, AG) that at least three of the prepositions are fully synonymous. I believe that full synonymy is quite rare, if it occurs at all. Recall that 'overlap' is my term for "partial" synonymy, and synonymy is a phenomenon which is closely related to identity. I see the treatment of synonymy in speech as a reasonable parallel to the treatment of identity in speech. In mathematics and logic, a statement of identity like x = y asserts that x and y are the same thing; that is, they are not two distinct things but are one. But people often say "x is the same as y" without meaning that they are talking about a single item. They are clearly referring to two distinct things, and what they are actually saying is "x is close enough to y for present purposes." Thus overlap, which does not insist that the overlapping elements be identical but asserts that they are close enough for some purposes, is consistent with the actual usage of identity in speech. Given this consideration, the frequency of apparent synonymy and the rarity of full synonymy should not be surprising.

IV. SOME AFTERTHOUGHTS ON FORMALIZATION

This study includes descriptions of one set of linguistic data at three levels of formalization. The first level of formalization is represented by the one-to-one groupings of sememic role role bundles with preposition-case pairs in (8). There is a distinct rendering of the description in table 1. This form of description is one which we have gotten used to in recent years. We have also become convinced that the table 1 type of description is somehow more sophisticated or at a higher level of formalization than the description in (8), which is consistent with Bloomfield 1933. In fact, the descriptions in (8) and table 1 are at the same level of formalization. They both represent each preposition as a distinct bundle of sememic roles.[8]

A somewhat higher level of formalization is represented in the description formed by combining (7) with table 2. The description so obtained has a generalized statement of sememic role relations, including all of their possible combinations and their cooccurrence restrictions. This alone makes it at a higher level of formalization than the (8)-table 1 description. But there is more. The algorithm in table 2 exploits the cooccurrence restrictions included in (7) to simplify the statements involved in producing the prepositions. It does this by removing the redundancies implicit in the six-way repetition of LOC and PRX in (7). In short, this level of formalization is two steps above that represented in the (8)-table 1 description.

But the description in figure 3 is at a still higher level of formalization. The (7)-table 2 description accounts for the possible combinations of this set of sememic roles, the realization of the prepositions and of the (genitive) case for any occurring combination, and the morphosyntactic sequence of the morphemes. That is, it accounts for the way certain geometric possibilities are encoded into a preposition and a case. But it does not account for the way a given sequence of morphemes is decoded into sememic roles. Figure 3 accounts for the encoding capabilities present in the (7)-table 2 description and for the decoding as well. It is thus the highest of the three descriptions in degree of formalization.

Please note, however, that I am not insisting that the relational network diagrams are the pinnacle of formalization or even that relational network diagrams are necessary to attain this level of formalization. I want to consider these two disclaimers separately.

First consider the level of formalization reached. Now each node in figure 3 has an internal logical structure. This implies that there is at least one further level of formalization in a purely logical sense. Beyond that is the inclusion of neurological considerations directly in the description. This would move us not merely to another level of formalization but to another plane of description. In short, rather than claiming that relational network diagrams are the best that can be done, I am simply claiming that they are three degrees of sophistication beyond what most linguists consider "formalized". There are heights of descriptive formalization beyond even these which have yet to be essayed.

Finally, consider the necessity of relational networks to attaining this level of formalization. Those who are fully aware of what is necessary to this level of formalization can choose to effect the description in words alone, as Griffen does, by using algebraic statements like (7), as Gleason and Fleming do, or by some other method. Any model which does not restrict the descriptive abilities of the theory will do.[9] But by the same reasoning, a model which restricts the descriptive abilities of the theory or a theory which puts arbitrary limitations on the linguistic data it will accept should be discarded. At the least it should not be called a theory of language.

NOTES

1) Indeed, the analytical acumen and successes of Ruhl, Makkai, and Backlund have sustained me in the course of my extended analysis of Russian locus expressions.

2) I am indebted to Sydney Lamb of Rice University for this example.

3) In general I prefer to avoid the expression "*partial* synonymy".

4) Originally part of a short narrative from a native speaker, I have edited and shortened it slightly.

5) One native speaker accepted *podle* without prompting from me, but as she is an "ethnic nationality" I simply note the datum without drawing conclusions. The size of the sample makes it too small for statistical correlations of any significance; I asked only to buttress my own (non-native) judgement.

6) Though the lack of full empirical verification troubles me personally, it should arouse no more comment in the linguistic community at large than the total lack of empirical verification (or even the possibility of same) which accompanies almost all empirical claims made in less controversial theoretical frameworks.

7) This is historically an adverb derived from a prepositional phrase which is becoming a preposition.

8) Without intending to downgrade either format I comment that a practicing psychologist once told me that a table 1 type of presentation "looks much more scientific" than the type of presentation in (8).

9) I use relational networks partly because I tend to overlook some of the more obvious relations if I do not use them.

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VI

DISCOURSE STUDIES

THE EFFECT OF ITERATION AND CONTRAST ON TOPIC SALIENCE

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0. A topic is not just a central concept, it is almost always a reiterated one. The topic NP of a sentence, for example, most often denonominates a referent that is both central to the information communicated and also iterated within the discourse context. The iteration may be effected through anaphora, substitution or lexical repetition, establishing direct coreference between an NP and an antecedent; or the NP may bear some set-membership relation to a preceding NP.

Iterated reference alone, however, does not identify sentence topic, since referential linkage[1] may be characteristic of more than one NP in the sentence. Alice Davison, in "Syntactic Markedness and the Definition of Sentence Topic" (1984) suggests that sentence topic is signalled--when it is overtly signalled in English--by certain marked syntactic constructions. Marked syntax, Davison suggests, effects an incongruity between the surface syntax and the underlying syntactic role of an NP and thus slows sentence processing. This, in turn, focuses attention on the NP in marked position and presents it as the most salient referential link to the discourse context.

Davison situates sentence topic in a dynamic model of sentence processing, exploring its role in linking each sentence, in turn, to the preceding discourse. Although the account assumes referential linkage, Davison does not explicitly discuss the contribution of repeated reference itself to topic salience. Nor does she speculate about the effect of iterated reference and marked syntax, if any, on establishing an NP referent as salient within a larger discourse context.

However, we might expect iterated reference not only to contribute to the salience of sentence topic but also, in longer contexts, to have more effect than marked syntax in making an NP salient. The ability of iteration to endow salience is established by a considerable literature linking repetition and recall. Similar claims are not made for surface structure features such as marked syntax, despite the evidence that surface structure does affect immediate processing (see Bransford and Franks, 1971, and Davison, 1984: 799-802, for a review of this evidence).

Moreover, although paragraph topic is not well understood, reiteration seems to play a part in establishing NP referents as discourse topics. Thus, Katz (1980: 26) defines discourse topic as "the *common theme* of the previous sentences in the discourse." Perfetti and Goldman (1974; 1975) equate paragraph thematization, i.e., topic coherence, with the inclusion of propositions making repeated reference to a single NP referent. And de Beaugrande and Dressler (1981: 104) suggest that

discourse topic is reflected in "density of linkage," i.e., multiple conceptual links between a referent and attributes posited in the discourse. Thus--to the extent that linguistic features influence NP salience--it might be expected that iterated reference would have more effect than marked syntax in a paragraph context.

In fact, however, preliminary investigation offers evidence that several different kinds of referent salience are at work in contexts larger than a sentence. In a 2-sentence context, not only iterated reference, but also contrast, can predominate over marked syntax--up to a point of markedness; but the more marked the construction, the more syntax competes in establishing prominence. And in the identification of NP referents to be included in a global summary of paragraph content, marked syntax, repetition, and contrast all have an observable effect.

This effect deserves further study, for if more than one kind of referent salience exists within a text, the concept of discourse topic may be even more complex than hitherto assumed--arising through the integration of syntactically marked sentence topics with a web of iterated and contrasted referents also salient within the paragraph.

I. Davison (1984: 806-820), offers a description of sentence topic based on the correlation of a hierarchy of NP definiteness with the hierarchy of syntactic markedness given as (1) below:

1) **Somewhat marked:**
   a) *active:* This book discusses policemen.
   b) *passive:* This book was written by a policeman.
   c) *raising to subject:* This book seems to be written by a policeman.

   More marked:
   d) *prepositional passives:* This book has been scribbled on by a two-year-old.
   e) **tough movement:** This book is hard for a two-year-old to understand.
   f) *raising to object:* We believe this book to be too hard for a two-year-old.
   g) *Richard:* This book looks like its been abused by a two-year-old.

   Most marked:
   h) *left-dislocation, right-dislocation:* This book, a two-year-old destroyed it. A two-year-old destroyed it, this book.
   i) *topicalization:* This book a two-year-old destroyed.

Davison shows that those items lowest on the hierarchy of NP definiteness--i.e., those most difficult to identify in a discourse context--are less acceptable in the marked syntactic structures in (1) than in their unmarked counterparts. So, for example, "a typical insect," a generic NP relatively low on the hierarchy of definiteness, occurs less felicitously in

(2a) below than in (2b), its unmarked counterpart:

2) a. ?We believe a typical insect to eat flies.
   b. We believe that a typical insect eats flies.

Also, NP's low in definiteness are least acceptable in the most marked syntactic constructions. If a sentence topic constitutes a link with the discourse context, indefinite NP's should make poor topics. Thus the infelicity of such NP's in the marked constructions in (1) is explained by the fact that these constructions are associated with sentence topic.

II. Although Davison does not offer textual evidence that these constructions identify topic, survey of 3 texts confirms that the NP which they dislocate or promote to surface subject usually constitutes a salient referential link with a preceding sentence. However, although instances are relatively rare, all but the three most marked constructions can also introduce new NP referents into the context. And in contexts in which one NP is marked and another NP repeated, iteration can predominate over most of the marked constructions in making an NP salient. For example, in (3a) below, *this book*, the NP promoted to subject in the marked construction, will be identified as topic when the sentence is presented in isolation; however, when the same sentence is placed in a context such as (3b) in which another referent, *policemen*, is iterated, the iterated referent acquires topic prominence:

3) **passive:**
   a) *This book* was written by a policeman.
   b) Policemen have been in the news a lot recently. This book was written by a policeman.

Examples (4-8) show that a similar effect may be achieved with five of the other marked constructions:

4) **raising to subject:**
   a) *This book* seems to be about policemen.
   b) Policemen have been in the news recently. This book seems to be about policemen.
5) **prepositional passives:**
   a) *This book* has been scribbled on by a two-year-old.
   b) Two-year-olds need a lot of attention. This book has been scribbled on by a two-year-old.
6) **tough movement:**
   a) *This book* is hard for a two-year-old to understand.
   b) Two-year-olds need a lot of help. This book is hard for a two-year-old to understand.
7) **raising to object:**
   a) We would expect *this book* to be too hard for a

two-year-old.
b) Two-year-olds need a lot of help. We would expect this book to be too hard for a two-year-old.

8) **Richard**
a) *This book* looks like it's been abused by a two-year-old.
b) Two-year-olds need to be watched every minute. This book looks like its been abused by a two-year-old.

As the markedness of the constructions increases in (4-8), however, it becomes more and more likely that the (b) examples will be perceived as having two topics, or as preparing for a topic change. And, as (9 a-c) shows, the three most marked constructions are so odd as to be ungrammatical in a context in which another NP is made salient through iterated reference.

(9) a) Two-year-olds need a lot of attention. ??This book, a two-year-old destroyed it.
b) Two-year-olds need a lot of attention. ??A two-year-old destroyed it, this book.
c) Two-year-olds need a lot of attention. ??This book a two-year-old destroyed.

Examples (3-9), of course, offer additional evidence for Davison's hierarchical arrangement of the marked constructions and for their increasingly strict association with a referentially linked NP. They are presented here, however, to illustrate the fact that NP salience may be endowed by iterated reference alone (3b-8b), as well as by syntactic markedness alone (3a-8a), and by the two in combination (the normal case, whose violation results in the unacceptability of 9a-c).

A similar point may be made by placing the marked construction in a context in which another NP referent is contrasted, rather than iterated. As (10) below shows, contrasted reference may also establish a salience of its own that can compete, up to a point of markedness, with that established by marked syntax:

10) a) **passive:** Poodles make better pets. Gerald was mauled by his Great Dane.
b) **raising to subject:** Poodles make better pets. Gerald seems to be afraid of his Great Dane.
c) **prep. passive:** Poodles make better pets. Gerald was chewed on by his Great Dane.
d) **tough movement:** Poodles make better pets. ?Gerald is hard to dissuade from buying a Great Dane.
e) **raising to object:** Poodles make better pets. ?We would expect Gerald to dislike a Great Dane.
f) **Richard:** Poodles make better pets. ?Gerald looks like he's been mauled by his great Dane.
g) **left-dislocation:** Poodles make better pets. ??Gerald, his Great

Dane mauled him.
h) **rt-dislocation:** Poodles make better pets. ??His Great Dane mauled, Gerald.
i) **topicalization:** Poodles make better pets. *Gerald his Great Dane mauled.

In (10a and b), it seems relatively clear that the discourse is "about" dogs, the topic suggested by the contrast between *poodle* and *Great Dane*. However, the bridging inferences needed to link the sentences paired above become more and more difficult to make as we proceed from (10 a) to (10 i). By (10 e) it is difficult to posit a referent around which the sentence pair coheres, because contrastive reference and marked syntax have emphasized different potential topics.

Examples such as (3-10), of course, effect an artificial separation of iteration and markedness. In the normal case, as Davison has shown, marked syntax emphasizes an NP which is referentially linked to context. However, (3-10) are offered as illustrations of the potential of both iteration and contrast to endow NP salience; they suggest that, even in the normal case, in which iteration and marked syntax coincide, two kinds of salience are at work, both contributing to the prominence of the topic NP.

III. To investigate the presence of different kinds of salience in a paragraph, three informal exercises were conducted. In the first, a class of junior and senior English majors was asked to write a topic sentence for each of three paragraphs containing marked syntax and iterated reference. The term "topic sentence" was used because it was familiar to the students; however, they were told that what was asked for was a global representation of paragraph content, not an appropriate first sentence of the text.

In the second exercise, a similar class was asked to write topic sentences for paragraphs which varied from those in the first experiment only in number of allusions to an NP referent or in presence or absence of marked syntax. Specifically, the number of references to setting in paragraph 1 was reduced from four to two.[3] One marked syntactic construction (topicalization) was added to paragraph 2. And four marked syntactic constructions were removed from paragraph 3; these were replaced by the constructions identified by Davison as their unmarked counterparts. Paragraph 3 is given as example (11) below; (11a) is the marked version used in the first exercise, and (11b) is the version used in the second exercise, with the four marked constructions removed:

11) a) Sister Lucia joined the convent as an outsider, scorned by the urbanized young women already among the sisters. Not only had she no standing in town society, but she came from a mountain village; and townspeople considered mountain *culture* to be backward and superstitious. Her father was a prosperous man by village standards, but even his wealth was despised by the cultivated city-dwellers. However, *he* was hard to deter from his aims, and he had promised his only daughter to a convent from birth. Accordingly,

despite protests that she did not wish to leave the village, Lucia was sent to join the Sisters of Mercy. *These nuns,* town-bred themselves, seem to have done little to halt the persecution of the new novice, except to urge patience. *Patience* Lucia had. But the young village girl was never really accepted.

b) Sister Lucia joined the convent as an outsider, scorned by the urbanized young women already among the sisters. Not only had she no standing in town society, but she came from a mountain village; and townspeople believed that mountain culture was backward and superstitious. Her father was a prosperous man by village standards, but even his wealth was despised by the cultivated city-dwellers. However, it was hard to deter him from his aims, and he had promised his only daughter to a convent from birth. Accordingly, despite protests that she did not wish to leave the village, Lucia was sent to join the Sisters of Mercy. These nuns, town-bred themselves, did little to halt the persecution of the new novice, except to urge patience. Lucia had patience; but the young village girl was never really accepted.

In the third exercise, a class was given another version of (11a), which had been altered to remove contrastive reference. The references to "town" were removed in order to see if this had any effect on the inclusion of references to "mountain village," the contrastive lexical set.

Twenty-three students participated in the first exercise, thirty-three in the second, and forty-two in the third. The students had the paragraphs before them as they wrote, since the intent of the exercise was to see if iterated reference, contrast, and marked syntax influenced the choice of NP referents to be included in a global summary of paragraph content, not to test recall. For the same reason, in scoring, any allusion to a referent was counted as a mention; the topic sentence did not have to repeat a lexical item included in the paragraph.

TABLE 1

Probability of inclusion of iterated and contrasted referents

Lexical Set	Exp 1		Exp 2	
	No. reps.	pr.	No. reps.	Pr.
Par 1:				
17 century/Renaissance	4	.869	2	.548
Italy/Tuscan town	2	.304	1	.194
Par 3:				
mountain/village	4	.783	4	.387
town	5	.783	0	---

The results suggest that both repeated reference and allusion to a contrasting referent can influence the probability of the referent's

inclusion in a topic sentence. Table 1 above summarizes these results.

Table 1 shows that when the number references to time and place was decreased in Paragraph 1, the probability of inclusion within the paragraph summaries dropped from .869 to .548 (time) and from .304 to .194 (place). Similarly, when Paragraph 3 was altered to remove the 5 references to "town" which had contrasted with those to "mountain village," probability of inclusion of "mountain village" decreased from .783 to .387.

More interesting, because more unexpected, however, was the fact that marked syntax also seemed to increase the probability of inclusion. Table 2 below shows the marked syntactic constructions included in the first version of Paragraph 3 and replaced in the second, with the probability of inclusion of the NP referent in the resulting topic sentences.

TABLE 2:

Probability of inclusion of marked/unmarked referents

	Exp 1 (marked syntax)	**Exp 2 (unmarked)**
raising to object (culture)	.347	.194
tough movement (father)	.217	.194
raising to subject (nuns)	.435	.226
topicalization (patience)	.348	.161

As Table 2 shows, when syntactic markedness was removed, the probability of a referent's inclusion dropped by more than one-third in three out of four cases. The slightness of the decrease in references to *father* may derive from the fact that the father's determination constitutes a direct casual link in the chain of events described in the paragraph. Recall advantage for causal chain events is well-established (see Reiser and Black, 1982: 235-237) and here may perhaps have muted any effect caused by the removal of marked syntax.

However, even the probability of reference to *father* decreased slightly with the removal of marked syntax; and when marked syntax was added to paragraph 2, an increase in the probability of inclusion was observed. When an unmarked NP was topicalized for the second exercise, the probability of inclusion increased from .304 to .387.

The three exercises did not constitute a formal experiment, since the sample was not randomized. And, as noted above, further investigation is needed, with paragraphs better constructed to control for interactive effects. However, the consistency of the results is striking enough to

suggest that further investigation is merited. If inclusion in a topic sentence reflects a kind of salience, the three exercises suggest that marked syntax, repetition and contrast may all contribute to referent salience within a paragraph, approximately 150 words in length.

IV. Additional evidence for the dual salience of syntax and repeated reference is offered by a formal experiment testing recall. Perfetti and Goldman (1974), measuring thematization by "the number of underlying propositions containing the referent," investigated the efficacy of subject and object prompts for recall of the final sentence of a thematized paragraph.

They found that when subject was thematized, e.g., referred to six or seven times in the paragraph, the efficacy of subject as prompt almost doubled. And, interestingly, when the object of the final sentence was thematized, the efficacy of the object as a sentence recall prompt almost doubled, but the subject's efficacy as prompt did not decrease. Below is a table showing the probability of recall of the final sentence with subject prompt and with object prompt in three different cases: when nothing is thematized in the paragraph, when subject of the final sentence is thematized, and when object is thematized:

TABLE 3:

Probability of meaning preserving recall for the three experiments combined over two lists

Prompt Condition	**none**	**subject**	**object**
No context free recall	.32	---	---
No context prompted recall	---	.36	.36
Paragraph context, subject thematized	---	.65	.48
Paragraph context, object thematized	---	.65	.61

(Perfetti and Goldman, 1974: 75)

In their discussion of these results, Perfetti and Goldman speculate that sentence subject has a natural prominence in a discourse context in which any NP is thematized, but that thematization of another NP makes that NP salient as well. This suggests the possibility of two different kinds of NP salience--one that is derived from iterated reference within the

discourse and another that inheres in sentence syntax.

Although neither of the studies presented here is conclusive in itself, together they suggest a line of future inquiry in the investigation of discourse topic. For a perception of paragraph topic may be achieved through integration of the effects of sentence syntax with those of the other strategies for making a referent salient. Considered from the point of view of topic integration, a paragraph may contain NP referents of different kinds. Some of these may be appropriately signaled by marked syntax; others may be emphasized by strategies different in effect but equally potent in indentifying what the paragraph is "about." Among these strategies are reiterated reference and contrast.

Notes

[1] The term "referential linkage" is used in Reinhart (1980, 1981); but in her papers it refers to a property of sentences and one of three conditions for text coherence. As such, it is restricted in certain ways which are not relevant to my discussion. She states, for example, that two sentences are referentially linked if the topic or scene-setting expression of the second sentence is referentially controlled by a referent mentioned in the previous sentence (1980:173). As I am using the term, however, linkage is not necessarily restricted to topic or scene-setting expression.

[2] For example, Cacioppo and Petty, (1979) and Craik and Tulving (1975) found that repetition improved recall of linguistic material. And Garnham, Oakhill, and Johnson-Laird (1982)--in an experiment that suggests that repeated reference alone can generate a cognitive structure that aids recall-- showed that referential linkage improves recall of even randomised passages. See Young (1985) for a review of earlier literature connecting repetition and learning.

[3] It was not reduced to one because it was judged that to do so would remove a causal link within the content of the paragraph.

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DISCOURSE FUNCTIONS OF SUBJECT AND TOPIC

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1. Introduction

As a language with distinct postpositional markers for subject and topic, Korean presents a problem in adequately explaining how and when these particles are used.[1] Their usage relates to those of articles and stress in English, but only roughly, and has been an area of a great difficulty for nonnative speakers.

Linguists interested in Korean (and Japanese) have presented extensive studies on the intriguing use of the topic and subject particles in the language(s). What, then, is there more to talk about? I will give three reasons why I am addressing this much-explored area again. First, it is very difficult to explain the proper use of these particles; the question has proved recalcitrant. I should admit that even now with this study no definitive statement can be made. Second, I feel that earlier studies did not address the problem in their proper domain. That is, they have been limited to sentence grammar, while the domain of the use of subject and topic should be the discourse. Third, I think the results of even this seemingly language-specific use of the particles need to be related to the universal concern on subject and topic across languages.

In this paper the term **subject** in Korean refers to the noun phrase that is followed by the subject particle KA (ka after vowels and i after consonants), and **topic** refers to NP with NUN (nun after vowels and un after consonants). These definitions based on surface forms are necessary because in some studies the term subject refers to the grammatical function in the clause regardless of its surface case (Shibatani 1976 and 1977).

The topic particle NUN may occur instead of the subject particle KA, object particle (lul), and complement particle (ka in negative equative clause); whereas it usually occurs after such particles as location (e, esø, eta), time (e), indirect object (eke, hanthe), etc.[2] As such, the topic particle (TP) has a wide distribution. This study focuses on when TP is used instead of the subject particle (SP), i.e., when NP-NUN may be replaced by NP-KA in a given clause, not those instances when it is replaceable by the object particle or added after the location or time particle. Most occurrences of NUN in a text are of the kind studied here.

Kuno (1972) presented a functional study on the use of ga and wa, the subject and the topic particles in Japanese. He noted that ga is used for `neutral description´ or `exhaustive listing´, and wa for the `theme´ (generic or anaphoric) or the `contrasted element´ of the sentence (296). While his insightful study is

largely limited to the domain of sentence grammar, Hinds (1976) applied it to the narrative discourse in Japanese and said that there are four types of NPs that take wa in initial occurrence in a discourse: unique, contrastive, negated, and introductory.

Within Korean linguistics, there are recent studies by Sohn (1980, 1981) and Choi (1984), which are relevant to the present study. Sohn (1980) argues that the notion of topic or theme must be separated from the informational nexus of old and new. He regards NUN, KA, and other limiters all to be relevant to topic, each with its own specific meaning.

> Basically, ka/i has a meaning of **exclusiveness (exhaustive listing** or **uniqueness)**, whether it is simply a neutral description or focused as the only new (or activated) information in the sentence. The basic meaning of (n)un is **contrastiveness**, with Kuno's so-called **thematic** sense as its proper subset. Discourse contexts and sentential positions are responsible for various degrees of contrastiveness. ...exclusiveness and contrastiveness are semantically complementary (Sohn 1980:12-3).

He defines topic broadly as 'what the speaker is talking about now' or as 'spatial, temporal, or individual frame (denoted by a noun phrase) within which the sentence holds, with the applicability of the main predication limited to the domain of that frame' (Sohn 1980:1).

While I agree with him that these so-called limiters behave similarly as 'an S-dominated NP', I feel it necessary to focus on the type of information as new or old in discourse to explain the use of KA or NUN. Just as the indefinite article in English is generally used with new information and the definite article with old information, so is KA used with new information in general and NUN with old information. In each language, however, this is only a rule of thumb; there are additional language-specific rules that account for irregularities. The difference in meaning between contrastiveness and exclusiveness alone cannot guide us to the appropriate choice between NUN and KA. As Sohn himself notes, the meaning contrastiveness is considerably weakened, especially in sentence-initial position. Since NUN is the marker that denotes topic with no additional shade of meaning, I follow a host of linguists in referring to it as the topic particle (instead of calling all limiters topic markers as Sohn suggests).

The following sections explore the functions of subject and topic from the perspective of discourse as part of participant/topic reference system in a connected, unified discourse. Specifically, their functions in narrative discourse are focused in relation to types of information in narrative, using two short stories. (See Appendix for these texts given in English in very literal translation with KA and NUN inserted in parentheses after NPs; zero anaphora is either left zero in English also or a pronoun is inserted in parentheses.)

The final section of the paper attempts to relate the functions of subject and topic particles in Korean discourse to other studies of a similar type beyond Korean linguistics.

2. Known or Contrasted Information with the Topic Particle NUN

Old information that is known to and shared with the hearer, endophorically in verbal text and exophorically in situational context, is marked by the topic particle NUN. Thus anaphoric reference to a participant in a text is usually made with NUN. Situationally established information includes (1) reference to the speaker or the hearer, (2) reference to the participant's immediate family member, like mother or father, (3) reference to the participant's neighbors, and (4) reference to a new participant who is predictable in a given frame. The use of NUN for a frame-predictable participant is analogous to the use of the definite article in English in the first mention reference when the author assumes the participant is in the hearer's 'foregrounded frame' (Jones 1983). Thus, when the school is foregrounded in a discourse, reference to a teacher, a classroom, or a blackboard may take NUN. Most of the NUNs in our two texts exemplify anaphoric reference to a participant after the initial introduction of that participant.

Generic nouns referring to the entire membership of a class are marked by NUN. They are assumed to be shared by most people as part of their encyclopedic knowledge of the world. The direct quotation sentences in S14 and S17 in "The Hat Seller" (HS) have references to 'monkey(s)' with NUN as generic nouns.

(1) HS 14 wonsungi-tɯl-NUN moja-lɯl ssɯji.an-ɯni...
monkey-Pl-TP hat-OP not.wear-so
'Monkeys do not wear hats, so...'

When two NPs are contrasted in the text or situational context, NUN is used. This contrastive NUN may take extra stress in pronunciation. In (2), food is contrasted with bedding:

(2) tʌ̈jøp.hal ɯmsik-NUN øpsɯmnita-man
serve food-TP not.exist-but
jumusiko-man kasiketta-myøn tɯløoseyo
sleep-only intend.to.go-if come.in
'(I) don't have food to serve, but please come in if (you) only intend to spend the night.'

When used with the initial reference to a topic noun in conversation, the topic particle seems to have both thematic and contrastive functions. After an exchange of greetings, one might say,

(3) yojɯm kønkang-NUN øttøhasimnikka?
these.days health-TP how.is.it
'How is (your) health these days?'

Here, health is thrown in as a topic of conversation, but may be considered as contrasted with other possible topics of conversation. (Sohn suggests a thematicity-contrastiveness continuum.) It seems also to be related to the use of NUN with a generic noun, but is certainly not an anaphoric use in the text.

In summary, the topic particle NUN is employed for known information, a generic noun, or a contrasted noun.

In the Hat Seller text (HS), there are 13 occurrences of NUN, of which 2 are generic nouns (monkeys) and 11 are anaphoric references to old information. Of the 11 anaphoric references, 7

concern the hat seller, 3 the monkeys, and 1 the hats. In the Beauty and the Monk story (BM), all 10 occurrences of NUN are anaphoric: 7 reference the monk, 1 the tiger, 1 the girl, and 1 the backreferencing phrase `the thing which was pulled out of the throat´. Notice that NUN occurs most frequently in each story with the major participant, in clauses reporting his actions or changes of state (processes).

3. Focus on NP with the Subject Particle KA

The general rule is to use KA at the initial introduction of a participant as new information to discourse. At the beginning of a narrative we tend to focus on the nouns (participants) rather than on the verbs (their actions and events). Focus on an NP is achieved by the use of KA, which marks the NP as prominent with either neutral description or exclusiveness meaning of the subject particle. Low focus on the verb is often marked by the use of the existential verb iss or the progressive aspect ko.iss. (S1 of the HS text (in the Appendix) where the existential verb is used, and S3 of BM, in which the progressive aspect occurs.)

This general rule, however, may not be followed in some cases where a story starts in the middle of the action of a participant and identifies him later, much as in an English story where he or she is used without identification at first. In those cases the initial reference to a participant is made with NUN, after a series of zero anaphora in reporting his actions. Since his actions are already narrated, the participant is no longer new and the reference to him takes NUN even though it is actually the first explicit reference in the text.

The subject particle KA is used to reintroduce a participant on stage. S16 of BM exemplifies this, where khun holangi `big tiger´ is marked by KA. In fact, the association of new information with KA is so strong that we may suspect that the tiger may be a different one from the earlier one, but the pragmatic knowledge of the culture is such that readers know that it is the same tiger, which has come back to show its gratitude. With the verb of appearance nathana, KA is called for, unless a contrast is made with another participant. When no appearance verb is used, a participant who is established as the major topic of the text is reintroduced with NUN also.

An NP in a relative clause takes KA even though the NP is already known, as in moja jangsa-KA `the hat seller´ in HS 6 and moja-KA `the hat´ in HS 8. In his article "Why not a topic in a relative clause?" Bak (1984) argues that since a relative clause and its head constitute a single semantic unit (as a unit of informational processing), we may not have two topics (with the property of `aboutness´), one as the relative head and the other as the topic in the relative clause. Normally, two topics do not occur in one clause, for two conflicting topics within a single unit would confuse us as to what is being talked about. I concur with him on the idea of one topic in one informational processing unit (a clause in most cases). Thus, when we have 2 NUNs in a clause, we tend to interpret the second one as a contrastive NUN.

Perhaps the definite article the in English has the property of shared information but not of `aboutness´, and it can be used in a relative clause. The NUN in Korean, however, has the property of both and may not occur in a relative clause (except in a few cases as discussed below).

When an NP occurs with certain qualifying adverbs in a relative clause, the NP may either take KA or NUN. An example from I.S. Yang (1972:232) follows:

(4) jon-KA [na-NUN musimkho han] mal-ul
John-SP I-TP without.malice do word-OP
ohähätta
misunderstood
`John misunderstood what I said with no malice.´

We must use KA after `I´ if the relative clause does not contain the adverb. With the adverb, either particle (subject or topic) may follow the noun. What, then, is the difference in meaning? It seems that the above example with NUN focuses on the event (the fact that `I said something with no malice´), while the same example with KA in the relative clause focuses on the participant (the fact that it is `I´ who said the word with no malice).

In some examples which typically carry double subjects (or topics), the first NP may be followed by NUN and the second by KA in a relative clause:

(5) [jon-NUN khi-KA khutanun] sasil-ul kiøkhä-la
John-TP height-SP tall fact-OP remember-Imp
`Remember that John is tall.´

This restriction to KA in a relative clause is in general a fairly strong constraint at the clause level. For example, if we use KA for the monk in BM 7, we tend to interpret the monk as part of the relative clause, resulting in misinterpretation.

A subordinate clause in most cases takes a KA noun phrase as its subject, e.g., those with the meaning of `if´, `when´, `as soon as´, `after´, etc. (S17 of HS, where `I´ in the `if´ clause is marked by KA.)

There is normally one topic per clause unless there is an additional contrastive NUN. In the following example, since the temporal setting is marked by NUN, the reference to the participant already introduced in the preceding sentence is made with KA.

(6) halu-NUN hol ømøni-KA jip-ul ttønasi-myønsø
one.day-TP lone mother-SP home-OP leave-as
´One day the widowed mother was leaving home...´

If we don´t want to make `one day´ a topic, the sentence would read: ønu nal hol ømøni-NUN... in which the mother as a known participant takes NUN. While both forms are natural in the flow of the given text, we might speculate that the NP (mother) with KA is focused in that clause and the clause with the NP with NUN focuses on the event.

KA is employed to place an NP in focus. All wh-question words such as nu(ku) `who´, muøs `what´, and ønje `when´ necessarily take KA because they are focused bits of information being sought (except in contrastive cases). The NPs in the corresponding

answers also take KA to focus on those NPs. Consult S11 of HS for the use of KA with nu `who´. If we were to supply an answer to this question, it would be something like:

(7) wønsungi-tul-KA kaji-ko katta
monkey-Pl-SP take-and went
´Monkeys took them.´

There are certain (types of) verbs which require KA in the immediately preceding NP (unless there is a contrast). These are verbs of existence (iss `exist´, øps `not.exist´, manh `be.abundant´, and jøk `be.few´), which are used to express possession as well, with another noun as possessor, marked either by NUN or eke (dative); the inchoative verb twe `become´; the verb of appearance nathana; philyoha `need´; emotive and psych verbs, such as joh `pleasing, like´; mip `dislike´; musøp `fear´, etc. The existential, inchoative, and emotive/psych verbs are typical examples of the so-called double-subject construction, in which the unmarked order is NP-NUN NP-KA and the verb.

In looking through the various constraints on the use of KA, a curious picture emerges: in every case KA exercises some focus on the preceding NP, while the VP, or the clause as a whole, reports static and background information in narrative rather than dynamic actions and events. Introduction and reintroduction of participants set the stage for events to take place, but they themselves are not dynamic information. Relative clauses and subordinate clauses (adverbial clauses in English) are found to report typically background information supporting the mainline information or to recapitulate earlier events (Hopper and Thompson 1980; Longacre, Forthcoming). The existential, inchoative, and emotive/psych verbs, which call for KA-marked NPs, are also state or process verbs, rather than action or action-process verbs (see Chafe 1970 for the four basic types of verbs).

In summary, KA occurs in clauses that report background and static type of information in discourse, setting the stage by introducing participants and giving explanatory information by occurring in relative and subordinate clauses.

In "The Hat Seller" there are 10 occurrences of KA: 2 for introductions, 3 in relative clauses, 1 in a subordinate clause, and the remaining 4 in exclusive focus function. When we see this distribution with participants, the number of KAs is more limited, that is, both the hat seller and the monkeys are each referred to with KA twice--at initial reference and in a relative clause.

In "The Beauty and the Monk" KA ococurs 14 times: 9 for introduction and reintroduction of participants, props, and the like (pagoda, legend, sound, a long thing), 2 in relative clauses, 1 in a subordinate clause, and 2 for exclusive focus with verbs of existence (iss `exist´ and øps `not.exist´). KA used with participants is much more limited so that the monk takes KA only twice (at introduction and in a relative clause) and the tiger twice (at introduction and reintroduction). The girl never occurs with KA, appearing on stage as a patient with the object particle lul and being referred to so twice more.

4. Comparison of the Subject and Topic Particles

Using KA for new information (at the introduction of a participant) and NUN for known information (in subsequent references) as the primary rule, we may set up a secondary rule to use KA for known information when it occurs in a relative or a subordinate clause or when the NP needs to be focused. These may be set up as ordered rules.

The subject and topic particles may be compared as follows according to their typical functions in discourse:[3]

SUBJECT PARTICLE KA	TOPIC PARTICLE NUN
Focus on NP (Participants):	Low Focus on NP:
Introduction & reintroduction	Subsequent reference
New information	Known information
Non-anaphoric	Anaphoric & generic
Items not predictable in frame	Frame-predictable items
Low Focus on VP:	Focus on VP (Actions/Events):
Relative and subordinate clauses	Independent and non-final coordinate clauses
Static & background information	Dynamic & foreground information
Existential/possessive, emotive/psych, appearance, inchoative verbs	

The distribution of the two particles in the two Korean texts are shown as follows:

"The Hat Seller"

	Hat Seller	Monkeys	Hats
KA	2 (introduction & rel.cl.)	2 (introduction & rel.cl.)	1 (relative clause)
NUN	7 (anaphoric)	5 (3 anaphoric & 2 generic)	1 (anaphoric)

"The Beauty and the Monk"

	Monk	Tiger	Girl
KA	2 (introduction & rel.cl.)	2 (introduction & reintro.)	0
NUN	7 (anaphoric)	1 (anaphoric)	1 (anaphoric)
lul	0	0	3

Major participants in both texts are referred to with NUN more frequently than any other participants, whereas the occurrence of KA does not seem to be affected by the status of a participant. This is no accident since NUN marks the continuing topic, the participant who acts as an agent instead of being affected by an action as a patient. The girl in BM is only once marked by NUN, when she refuses to go back to her parents (a volitional action), while she is marked by the object particle lul three times functioning as a patient.

5. Concluding Discussion

We have seen that a participant in Korean narrative is typically first introduced with a noun phrase followed by the subject particle KA. Once introduced, the participant in subsequent references may not be overtly referred to, i.e., zero anaphora, or may be referred to by a noun phrase followed by the topic particle NUN. To put it broadly, KA corresponds with new information, and NUN with known/old information. The topic particle is employed for information that is assumed by the speaker to be shared with the hearer either in verbal or situational context. In addition to its occurrence with new information, the subject particle is also used with known information to focus on nouns or introduce a participant and when the NP occurs in relative and subordinate clauses. This summary suggests that the notion of new versus old information is the single most important criterion in the use of the particles. Although Sohn (1980) objects to this approach, I don't think it wise to discard such a crucial rule of thumb.

The words **subject** and **topic** have been used in linguistics in a variety of ways. Subject-predicate and topic-comment are both described as forming a bipartite structure of a sentence consisting of 'what is being talked about' and 'what is said about it'.

The papers in Subject and Topic (Li 1976) show that a rigorous distinction between subject and topic is hard to make. Keenan's (1976) definition of subject--with some 30 properties--seems to have both subject and topic scrambled into one concept. Li and Thompson (1976) set up seven criteria for distinguishing topic from subject: topic is definite, has no selectional restriction with verb, is not determined by verb but by discourse constraints, is constant across sentences in its function, rarely has agreement with its predicate (comment), is in sentence-initial position, and is syntactically independent of the rest of the sentence. They conclude that topic is a discourse notion and subject a sentence-internal notion.

There is no doubt that the continuing topic (participant) in a discourse has as its domain the discourse. But what about subject? Subject may have as its basic domain the sentence, in that it encodes mostly new information without assuming prior knowledge of the participant. However, subject also receives discourse constraints in introducing, focusing on participants, and reporting static and background information, though it is true that it receives less constraints than topic does.

Although Korean uses both subject and topic particles (thus classified as subject- and topic-prominent languages by Li and Thompson), it has, as Sohn (1980) argues, all the characteristics of topic-prominent languages. We have seen that the major participants marked by NUN are mostly acting as agents. To put it in another way, those NPs with NUN (not those with KA) are the primary arguments occurring together in the clause that are determined by the types of verbs and case frames. In that sense, topic NPs with NUN do have selectional restrictions with verbs and

are determined by verbs. (The monk in BM `goes out´, `advises´, etc. as an agent with action verbs; he `knows´ and `is embarrassed´ as an experiener with process verbs. In all these instances, the monk is marked by NUN.) It is true, however, that subject particles are required for some specific kinds of verbs, such as existential and emotive/psych verbs. Unlike theme in English (Fries 1981), topic in Korean, as Sohn notes, is not required to be in sentence-initial position.

Of the three kinds of subject (Halliday 1984), the logical subject (as agent) and the psychological subject (as theme) are associated with topic in Korean, while the grammatical subject (as modal subject) may correlate with subject as well as with topic.

In English, Tomlin (1985) finds that the subject primarily encodes theme and secondarily the semantic role of agent. In Korean, topic with NUN has the same function. We need to add here that zero anaphora is similar to topic in its function in discourse. In fact, zero anaphora is higher in the topic continuity scale than topic (Givon 1983). Subject is much more limited in its function in discourse than either zero anaphora or topic. We can set up a scale of continuous and accessible topics as follows:

(8) zero anaphora > NP-NUN > NP-KA

Finally, we cannot but agree with Halliday (1984:7) that the category of subject has been `one of the most obscure and controversial categories in western grammatical theory´ and that grammatical categories are ineffable.

NOTES

1. Some preliminary thoughts of this paper were discussed in Hwang 1981. Fred Lukoff´s romanization system is used here.
2. See Hwang 1975 for three categories of Korean particles according to this characteristic distribution: primary particles are those being replaced by NUN, secondary particles those usually occurring before NUN, and tertiary particles are NUN and others behaving similarly, such as man `only´, to `also´, ya `at least´, etc. I.S. Yang 1973 and Sohn 1980 refer to these tertiary particles as (de)limiters.
3. The contrastive NUN, which may focus on an NP, and other exceptional cases mentioned above are considered atypical and thus are not included in the comparison chart.

APPENDIX

The Hat Seller

1. Once upon a time at a certain place a hat seller(KA) existed.
2. One summer day this hat seller(NUN) put many hats in a big box and went out to sell (them).
3. Wandering around the streets, (he) said, "Buy hats. Hats. (There) are men's hats, women's hats, and children's hats. The prices are also cheap," (he) wandered around all day long, but not even one hat-buying person(KA) existed.
4. The hat seller(NUN) was very tired, so after going for a while, (he) put down the hat box under a big tree; having the hat on and sitting that way, sleep(KA) entered (him).
5. On the tree ten monkeys(KA) existed.
6. These monkeys(NUN), seeing that the hat seller(KA) had come under the tree and rested, also wanted to put the hats on themselves like the hat seller.
7. Therefore, (they) came down the tree quietly, opened the hat box, put on a hat each, went quietly up the tree again, and were looking down at the sleeping hat seller.
8. After sleeping for a while, the hat seller(NUN) got up and was about to go with the hat box; then (he) was very surprised, seeing that not many hats(KA) were in the box.
9. (He) did not know what happened, so (he) looked for (them), looking all around.
10. However, not a single hat(NUN) was visible.
11. The hat seller(NUN) did not know what to do, so slapping his knee, "Why, who(KA) took all my hats?" saying, (he) looked up the tree.
12. At that time, the hat seller(NUN) was not able to say even a word, and only opened his mouth wide.
13. (It) was because all the monkeys(KA) were wearing the hats.
14. After a while, the hat seller(NUN) said, "Monkeys(NUN) do not wear hats, so bring (them) back to me."
15. However, the monkeys(NUN) neither gave (him) the hats nor said any word.
16. (To) this hat seller(NUN) a different thought(KA) occurred.
17. "Monkey(NUN) is the animal that does exactly as people do; so if I(KA) take off (my) hat and throw it on the ground, the monkeys also will probably do (so), following (me)," so (he) thought and took off his own hat and threw (it) on the ground.
18. The monkeys(NUN), which were watching from the tree top, did not wait and took off the hats as (he) did and threw (them) on the ground.

The Beauty and the Monk

1. Behind the Tonghak Temple in Chungchong Namto Province, the Brother-and-Sister Pagoda(KA) is standing even now.
2. About this pagoda a legend(KA) exists in which romance and horror(KA) are permeated.
3. A monk(KA) was keeping the temple alone and holding the Buddhist masses earnestly.
4. One day in the middle of night, a tiger's roaring sound(KA) was heard from outside.
5. Since (the tiger) was crying so plaintively and sadly, (the monk) held a torch and went out to see.
6. Sure enough, a big tiger(KA) had his big mouth open, roared as before, and looked imploringly.
7. The monk(NUN) knew that (he) was not going to harm him, went close, and looked into the mouth.
8. Something long(KA) was stuck in the throat.
9. Perceiving that (the tiger) was doing so because of this, the monk(NUN) put his hand into (the throat) and pulled out the object.
10. The tiger(NUN) finally stopped crying and disappeared, wagging the tail as if (he) were thankful.
11. The thing(NUN) pulled out of the throat was a silver hair rod.
12. The monk(NUN) thought that (it) must have stuck (there) while (he) had caught and eaten a woman.
13. (It) was dawn several days after this event(KA) existed.
14. From outside a tiger's roar(KA) was heard again.
15. The monk(NUN) went out to see, wondering what(KA) existed.
16. A big tiger(KA) came carrying a woman and was crying; then as soon as (he) saw the monk(KA) coming out, (he) put the woman on the ground and disappeared slowly.
17. The monk(NUN) saw the woman quickly, but (she) had already fainted.
18. (He) poured cold water (on the woman) and rubbed (her), thus (he) awakened the woman again.
19. (She) was a beautiful young girl.
20. (She) was a precious daughter of a nobleman who lived in Seoul.
21. The monk(NUN) advised the woman to go to Seoul immediately.
22. The reason is (people) at home would be worried that (she) must have died, being captured and taken by a tiger.
23. However, the girl(NUN) refused to do so.
24. The fact is that (she) wants to spend (her) life together with the monk who saved her life.
25. The monk(NUN) was embarrassed.
26. (It) is because a way(KA) does not exist (for him) to marry (her) as a person who is practicing asceticism.
27. Therefore, (the monk) took the girl as a sister, cut (her) hair, and devoted (himself) to Buddhism together (with her).
28. In order to commemorate this miracle-like meeting of the brother and the sister and their commendable sincerity, later people(KA) erected a pagoda and called (it) the Brother-and-Sister Pagoda.

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WORDS FOR DEVELOPMENT OF THINKING

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Discussion about the linguistic basis of intellectual skills usually centers on precision, acquisition of language in general, or vocabulary for cultural artifacts. Occasionally it may consider mathematical symbols for logical operations. A question seldom asked is, "What kinds of words and structures are most useful for developing and expressing extended thoughts on any topic?" An answer to this question could help in teaching, translating, and analyzing discourse and genre, especially exposition. Since an important part of the answer is cohesion, it could also provide theoretical insight on problems of cohesion: why it is difficult for student writers and why it disappointed the analysts who hoped it would be a quick index to the quality of student writing. To begin to answer this question, we can chart the types of thinking to be developed and then list for each type some cohesive expressions, non-cohesive structures, and content vocabulary that express it.

What are the types of thinking that need to be developed in serious writing of academic quality? The rhetorical modes of thought that have endured since Aristotle seem to be the natural working of the human mind, reasons D'Angelo (57-58). He lists ten static and progressive logical patterns of arrangement which are traditional rhetorical modes such as definition, classification, comparison, and cause-and-effect. Although he warns that the patterns overlap and seldom appear in pure form, they provide a systematic list of kinds of thinking or development that are common in academic writing. D'Angelo's list of patterns provides the headings for the columns on the chart entitled, "Development by Cohesion, Structure, and Content."

Many cognitive psychologists picture thought and meaning as existing in networks (Lachman et al, 444-446). When writers want to develop an idea in one of the patterns, they arrange their bits of information in networks and choose expressions and grammatical forms for relating the parts in both senses of <u>relating</u>, "telling" and "connecting." One tool for extending a thought beyond a single sentence

Development by Cohesion, Structure, and Content

	DESCRIPTION	DEFINITION	PARTITION	CLASSIFICATION	EXAMPLE
TERMS COHESIVE BETWEEN SENTENCES			Ordinal numbers, Additive conjuncts	General classes	Specifics with general classes
OTHER TYPES OF STRUC-TURES	Attributive adjectives or details that entail or imply them	General classes with specified limits		Predicate nominatives	
EXAMPLES OF POSSIBLE CONTENT WORDS	above	characteristic	allocate	admit	archetype
	abroad	connote	allot	aggregate	case
	abut	convey	alphabetize	analysis	demonstrate
	adhere	denote	alternate	array	designate
	align	determine	another	assemblage	especially
	altitude	distinctive	apiece	assortment	example
	apart	distinguish	apportion	branch	exemplify
	approach	essence	arrangement	bunch	expressly
	area	exclusive	assign	bundle	illustrate
	arm	express	attribute	catalog	instance
	around	imply	between	category	model
	asunder	inclusive	catalog	class	namely
	away	indicate	certain	clump	particular
	back	intend	chain	cluster	precedent
	background	label	codify	collection	prototype

Development by Cohesion, Structure, and Content (Continued)

	COMPARISON-CONTRAST	NARRATION	PROCESS	CAUSE-EFFECT	SYLLOGISM
TERMS COHESIVE BETWEEN SENTENCES	Comparatives, Adversative conjuncts	Temporal conjuncts	Temporal conjuncts	Causal conjuncts	
OTHER TYPES OF STRUC-TURES	Superlatives, Negatives, Verbal after meanings of begin or stop, Simile, Metaphor	Time order with same grammatical subject	Imperative, Time order		General Classes with specifics and all or no
EXAMPLES OF POSSIBLE CONTENT WORDS	aberration	aboriginal	actual	account	all
	accord	afternoon	advent	accrue	always
	affinity	afterward	anticipate	affect	climax
	agree	age	approach	arise	complete
	alien	ago	change	attribute	comprehensive
	allegory	ancestor	coexistent	because	conclusion
	allied	ancient	coincident	beget	consider
	alliteration	antecedent	coming	breed	consummate
	allusion	antedate	contemporary	bring about	corollary
	alternatively	antiquate	current	calculate	criticize
	analogy	antique	descendants	cause	culmination
	antagonism	archaic	doomsday	conduce	customary
	antipodes	autumn	earlier	consequence	decide
	antithesis	back	eventual	consequently	decree
	antonym	before	expect	contingent	deduction

is the cohesion system described by Halliday and Hasan. Although much cohesion holds attention on old information that is given in previous sentences or is otherwise recoverable, some cohesive ties specify how subsequent information develops an idea stated in preceding sentences. Previous information must be held in mind while it is analyzed in any way: classified, compared, contrasted, defined, described, divided, doubted, exemplified, explained, extended, limited, questioned, or repeated for any of dozens of reasons. Some of the types of cohesive ties specify the nature of the link between sentences. That link identifies the mode of rhetorical development, locally if not globally.

We can attempt to distinguish two types of cohesive ties: static ties, which hold attention on previous information, and dynamic ties, which manipulate or develop that information. Although the dynamic ties include many transitions, called conjunctives in Halliday and Hasan's taxonomy, they also include other types of words, such as comparatives. Conversely, the ties that hold attention on old information are not strictly substitutions, ellipses, reference words, and lexical repetitions. Static and dynamic ties work together to focus on a topic and develop it. Static ties are essential for holding attention on the topic, while dynamic ties signal its rhetorical development. Dynamic ties, we shall see, are rarer and more difficult for students. Specific subtypes of dynamic ties are listed on the chart immediately below the type of development that they indicate.

Dynamic cohesive ties include words such as secondly, bigger, later, and consequently. Because they lead to further development of an idea in another sentence, they avoid the problem of one-sentence paragraphs, which is common among writers who have little experience in writing that must be more elaborate than their everyday speech, which is often extremely effective. Cohesive terms become the theme of a sentence when they are transitions at the beginning of a sentence, labeling its type of development very specifically and emphatically. Potentially cohesive terms within a sentence may be used in a way that is not cohesive but that develops the sentence locally according to one of the rhetorical patterns.

Among the patterns of development, description and definition have no special cohesive ties to signify them invariably and independently. Within classifications of any type, including descriptive and defining

classifications, specific items can be connected with additive conjunctives, such as the ties furthermore and next. These ties seem to refer to either spatial or temporal sequence in a situation, but when they are used cohesively, they may refer to different parts of the text, as well.

Although any additive conjunctives at the beginning of a sentence focus attention on the fact of the addition of further data, when writers want to emphasize that the new material is unexpected or different, they signal the contrast with an adversative conjunctive (like however). Along with these conjunctives, writers may also need words like different, more, or as many, or the comparative form of adjectives and adverbs, all of which are comparative reference ties in Halliday and Hasan's taxonomy. The adversative conjunctive ties and the comparative reference ties often work together to express a single semantic relationship within the text.

In a before-and-after contrast, an item is discussed as it changes over time, which is noted by a temporal conjunctive that indicates a time order arrangement. Temporal organization, accompanied by its signals, is very important in narrative and procedural exposition. Although causes occur before their effects, they can be presented in any order, especially when their relationship is articulated in some other manner, such as with a causal conjunctive or with a verb (like result or develop from).

The power of exemplification and classification comes from incorporating new information into prior knowledge. Associating the unknown with the known eases understanding and recall. This technique of reasoning also works in logical definitions with terms for class and species in a hierarchical relationship. Logical reasoning includes both inductive and deductive methods of reaching new information by the arrangement of old information. Inductive reasoning depends upon presenting first a sufficient number of specific examples and then relating them in a higher level generality, which uses superordinates. Deductive reasoning with syllogisms and enthymemes reaches conclusions about a specific new example by placing it in a hierarchical relationship with its superordinates. The classic example relates Socrates to the superordinate category man and then deduces from that category his shared characteristic of mortality. Of course logical reasoning, both inductive and deductive, requires cohesive superordinates and specifics and may use causal conjunctives as well.

As writers move on to develop new ideas about their topic, they naturally choose words that are associated with it and expected near it. Such associations are not easy to classify, but they are the type of tie that best correlated with writing quality in a study of cohesion in student writing by Witte and Faigley in 1981. Because they do not indicate any specific method of development, these cohesive associations are not listed on the chart. Continuing and summarizing ties are also missing. The continuing conjunctives (like _from here on_ and _well_) indicate forward movement only vaguely. The summarizing conjunctive ties introduce no new information but lead to reiteration after almost any mode of development.

Unfortunately, areas of cohesion become trouble spots in student essays (Pritchard, 1980). Cohesion requires understanding the relationships of ideas and also mastering grammar (such as comparative adjective form) and punctuation, especially the punctuation of complete sentences. The mechanics of writing often increase the burden so much that students present their thought weakly or lose it completely. Their primary problem is not learning how to perform intellectual processes, but learning how to put their thinking into the forms and expressions that an academic audience expects.

Experimental evidence shows that dynamic ties make greater demands on students than do static ties (Hartnett, 1985). Nevertheless, students have the following problems with both types of cohesion.

1. Fragments and run-on sentences that confuse the sentence boundaries across which cohesive ties operate in mature thinking that is too complex for a single sentence.
2. Forgetting distant subjects and exact wording.
3. Pronoun number, grammatical form, and antecedent.
4. Vagueness prior to ellipsis or substitution.
5. Synonyms chosen randomly.
6. Vocabulary problems with associated words, superordinates, and general words.
7. Differences in associations and collocations when the prior knowledge of the intended audience differs from the student writer's experiences.
8. Misused conjunctive expressions.
9. Lack of distinction between coordinate and subordinate ideas; misuse of parallel structure.
10. Weaknesses in organization.
11. Incomplete or inaccurate comparisons.
12. Comparative forms without any comparative meaning (e.g. _bigger_ to mean "very big").

13. Inappropriate tenses or malformed verbs.
14. The cognitive overload of combining mechanical details with higher level processes.

These problems cover much of the material taught in basic writing courses. To include them with the other necessary matters of thinking skills and organization, each unit must efficiently combine these features: (1) a purpose that motivates the particular type of communication and provides its context, (2) the appropriate rhetorical organization and development of the content, (3) the terms that best relate it, and (4) the grammar and punctuation which those terms require (Hartnett 1986). Students who have mastered these features are well on their way to writing proficiently.

When writers have become proficient, they are able to employ dynamic cohesive ties as they wish in order to introduce new information and develop it fully. The rhetorical manipulation that the ties signify is not neccessarily simple, but in good extended serious writing it must exist, and it must be clear. Signalled or not, it is what makes a text worth reading. Development is what distinguishes mature expression from the baby's sixteen cohesive repetitions of "Daddy gone." Furthermore, cohesive ties can be heuristic tools that help a beginning writer to plan and remember how to develop a thought. They clarify well; for instance, Shaughnessy used three cohesive conjuncts when she clarified the thought in an example of five sentences of poor student writing (46).

Despite the usefulness of dynamic ties, they are actually not essential for rhetorical development. They only label it. In the 1980 LACUS Forum, Jankowsky lists reasons why lexical linkage is often missing, at times purposefully, at times unintentionally. The value of transitional markers for reading ease has been questioned by Sloan and by Roen and Piche'. Examples of implicit relations abound in the two texts that Martin and others analyzed extensively; in one text four out of ten relationships were labeled implicit, and in the other thirteen out of twenty were. Halliday states, "The presence or absence of explicit conjunction is one of the principal variables in English discourse, both as between genres and as between texts in the same genre" (309). If a large number and variety of these explicit rhetorical markers occurred in a single paragraph, they might insert too many tangents, suggesting development in too many different directions all at once. They could create a disorganized, choppy, or undeveloped flavor.

When cohesive links are absent, how are the implicit relations expressed, if they are? What signals other than cohesion imply relationships between sentences? Halliday and Hasan give examples of time sequence indicated by certain predicates, prepositions, and subordinate conjunctions, none of which are inherently cohesive ties. Other expressions are the cues to intellectual processes that Odell lists. He suggests a base of various methods of expressing rhetorical mode within a sentence; on his base we can begin to build a system of identifying cues to intellectual processes. He includes various structures, some of which are listed below the possibly cohesive terms on the chart of "Development by Cohesion, Structure, and Content." Odell also suggests some vocabulary items which are included on the chart as examples of possible content words.

Odell's first process is focus, which he identifies with the grammatical subject of each clause. Although focus is not a pattern of development in any rhetorical system, it is a prerequisite for all predication and development. Maintaining focus on previously-given information is a function of the static types of cohesive ties, such as repetitions and third-person pronouns. They are necessary for all extended discourse in English, but they do not indicate any particular mode of development. Physical context is another one of Odell's categories that does not indicate a specific type of rhetorical development, but the remainder do express it.

When Odell discusses classification, he states his assumption that when a linking verb joins a predicate nominative and a subject, one of the noun phrases classifies the other. He includes with classification the lexical items for similarity, instead of listing them under comparison-contrast, as in this chart. Odell makes a separate category of change, which might be linked rhetorically with either narration or process, for both involve time. On the chart, change is a subdivision of contrast. I have also added simile and metaphor as methods of expressing comparison and contrast. Other figures might also be included there.

Odell combines temporal and logical sequence in a single category, although D'Angelo's outline distinguishes narration from process and cause-effect from syllogism, resulting in a four-part division of Odell's single category. This division illustrates well D'Angelo's warning that rhetorical patterns overlap. It is hard to justify the separation of some of the terms on the lists of possible content words.

The display of content words on the chart is intended only to suggest the range of useful terms; it is not exhaustive. The words listed have at least one sense that expresses the rhetorical mode under which they are listed. Because of the alternative senses, this list is not as precise as the lists of cohesion and other types of structures for indicating the mode of development. The alternative senses also prevent the words from serving alone as an index of genre (as for a computer program), although they might suggest genre (and we do need research on the amount of cuing required to make a reader interpret a piece of writing as of a certain genre). The vocabulary lists have pedagogical uses, and the entire chart can serve heuristically, suggesting structures and terms to a writer who is developing a thought.

The three-part division of the chart illustrates why no single type of feature can gauge writing quality or rhetorical mode. Halliday and Hasan never promised that their cohesion system could distinguish well-developed thought from dull repetitions and wandering chains of thought. Their work aids research and pedagogy, but they end Cohesion in English with a warning that analysis of cohesion does not evaluate the effectiveness of the methods of the text nor establish the value of the composition. Nevertheless, researchers and instructors hoped that cohesion might correlate highly with writing quality, since objective measures of writing quality are rare. Much research has found that overall counts of cohesive ties generally correlate with writing quality positively, but not highly (for example, see Witte).

Cohesion analysis provides an objective linguistic description of semantic relationships. Halliday and Hasan say that cohesion analysis can "show why text is interpreted in a certain way...explain the nature of conversational inferences, the meanings that the hearer gets out of the text without the speaker having apparently put them in" (328). It explains some of the ways of expressing the relationships within a text, so that readers can interpret it along with all of its presuppositions, inferences, and ambiguities. Cohesion is unique in its combination of thought and form, but many other optional expressions exist. Thus it is not a much better evaluative measure than any of the other artifacts of writing that reflect a writer's command of the resources of the language. Although quality is difficult to measure, the chart of "Development by Cohesion, Structure, and Content" suggests some of the countable artifacts that clearly indicate the development of thought.

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HELPING READERS DEVELOP STRATEGIES FOR EXPOSITORY TEXT

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Flood and Lapp (1986), based on their analysis of all the stories for grades one to six in the basal readers published by the eight major publishing companies, make the eloquently simple statement that "current teachers' manuals do not provide adequate instruction for teaching children about expository texts" (p. 296). While it is true that teachers have relatively recently discovered narrative structures (Mandler and Johnson, 1977) and now spend quite a bit of time teaching "story grammars" (e.g., Marshall, 1983; Wilson, 1983; and Matsuyama, 1983), expository text materials have remained a neglected focus--both by linguists and by reading teachers. There are two purposes of this paper: the first is to show some of the ways reading teachers are using insights from linguistics in teaching their students to read expository texts; the second is to encourage linguists to continue their analyses of expository texts.

It is not always clear just what is meant by the term expository text. The classification of texts into various genres differs from discipline to discipline, e.g., psychologists such as Meyer (1975) and Kintsch (with van Dijk, 1978) classify texts differently from those in artifical intelligence (e.g., Schank and Abelson, 1977) who, in turn, classify them differently from linguists (e.g., Grimes, 1975). For the classroom teacher, a set of classifications such as found in Longacre (1976) is helpful: narrative, expository, procedural, and hortatory.

Some describe expository texts by contrasting them with narrative, e.g., Graesser and Goodman (1985) describe the differences as relating to such things as truth value, time, space, oral/written forms, linkage, inferences, purpose, rhetorical features, and transitional words. According to Longacre (1976) the four basic features which differentiate narrative from expository discourse are person, orientation, time, and linkage. He goes on to further describe it by saying "expository discourse simply explains a body of subject matter" (p. 199).

Since different authors hold varying viewpoints as to just what comprises expository text (Kent, 1984), it may be helpful to look at a few examples. McGee and Richgels (1985) discuss the subcategories of expository text as being description, collection, causation, problem-solution, and comparison. Arena (1975) describes them as including enumeration, cause/effect, comparison/contrast, definition, process, analysis, and

illustration. Herber (1970) classifies them as simple listing, cause/effect, comparison/contrast, and time order; while Meyer (1975), basing her work on Grimes (1975), talks about problem-solution, comparison, antecedent/consequent, description, and collection (including sequence). Kinneavy (1969), using a slightly different point of view, looks at the purposes of the discourse and seems to find that expository discourse is exploratory, scientific, or informative. Although some such as Meyer (1975) and Kintsch and van Dijk (1978) have developed some relatively good working models for expository texts, much more work needs to be done, and such work needs to be communicated to the many teachers who seem to classify texts as belonging to one of only two categories: narrative or expository.

Children usually begin to acquire reading skills by reading narrative materials. It is not until about third or fourth grade that the focus changes to expository materials (Alvermann and Boothby, 1982). By this time the children are no longer expected to focus so much on the acquisition of reading, but are now spending more time reading to learn. Although they continue to receive reading instruction from the basals, they are expected to be able to read mainly from other subject oriented textbooks. This change of perspective from the reading process to the content of the materials is known as content area reading, i.e., "reading in subject-matter areas as history, science, mathematics, etc., usually for study purposes" (Harris and Hodges, 1981).

Too often schools teach children to read narrative materials in the basals and then expect them to automatically be able to handle the expository texts found in their content area reading. For example, Flood and Lapp (1986) in their analysis of genres used in basal readers for grades one through six used two measurements: number of selections, and number of actual pages for each genre. In counting the total number of selections they found that 41% were narrative and 16% were expository, and that "the most frequent form of writing at each grade level was narrative, that the score changed substantially by grade level, and that there were more than twice as many [narrative] selections at the preprimer level as there were at the sixth-grade level" (p. 287). In counting the number of pages allocated to each genre they found 66% to be narrative. This too differed by grade level: "Narrative selections comprised the greatest number of pages of each of the books, ranging from 88% at the preprimer level to 50% at the sixth-grade level" (p. 288). It is interesting to note that they include under expository texts a category of "hybrid" which are narrative in form but expository in function. If these were to be included under narrative, the percentages above would be even higher. The problem is that most of the reading students do beyond third grade is expository in nature and they receive very little instruction in strategies for handling it.

As McGee and Richgels (1985) have observed, "Children are more knowledgeable about narrative text structure (story schema or story grammar) than expository text structure, partly because of earlier and greater exposure to narratives" (p. 740). Because the student has less exposure to expository texts, the teacher must do everything possible to compensate for this lack of background. One of the best ways of compensating for the lack of experience with written expository texts, is to build on what they already know regarding the topic. Pearson (1985) suggests that,

> Too often we have asked "What is it that children do not know and how can I get that into their heads? The better question is "What is it that children do know that is enough like the new concepts so that I can use it as an anchor point?" (p. 5).

He proposes the use of semantic mapping.

Semantic Mapping

The purpose of semantic mapping is to develop vocabulary in a manner which will connect related categories the reader already possesses--and sometimes to expand those categories. Johnson (1983) presents the rationale for his vocabulary development strategies by saying,

> All words, like all real-world objects and events, can be placed in categories. In fact, the ability of the human mind to categorize, to examine the similarities and differences between two or more concepts, to draw relationships, is what enables humans to learn (p. 2).

Similarly, Pearson (1985) contends that "We can learn new concepts only in relationship to concepts we already possess" (p. 5). They propose the use of semantic mapping (or networks) for teaching important concepts and their interrelationships (Figure 1).

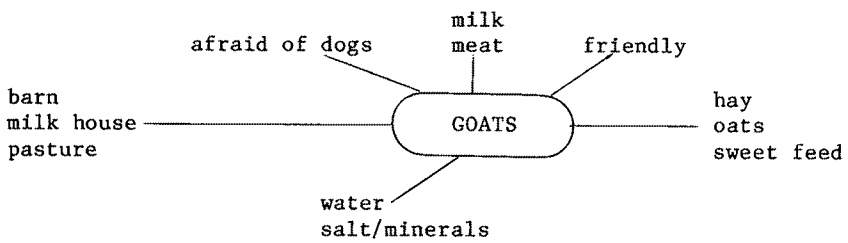

Figure 1

Johnson (1983) suggests the following steps be used to develop a semantic map:

1. Select a word central to the text to be read.
2. Write the word on the blackboard.
3. Ask the class to write down related words.
4. As class shares their words, attempt to categorize them on blackboard.

5. Number the categories.
6. Have class discuss reasons for various classifications.
7. Focus attention on categories closely related to text to be read (pp. 4-5).

This focus on concept development is especially important in light of current arguments over readability (Klare, 1984). It is of interest to note Pearson and Johnson's work which has shown that, "A reader's knowledge about a topic, particularly key vocabulary, is a better predictor of comprehension of a text than is any measure of reading ability or achievement" (Pearson, 1985, p. 5).

While it is important to build on concepts the students already have, some suggest it is also important to make them aware of structural relationships found in the texts they will be reading. Such relationships can be more easily understood by the use of graphic organizers.

Graphic Organizers

McGee and Richgels (1985) caution that teachers who will be working with the higher elementary grades, must first make their students aware of the difference between the form and function of language. One of the best ways of doing this is through the use of diagrams which show graphically the structure of the text in focus (Figure 2). In order to accomplish this they suggest that teachers follow the five steps below:

1. Select clear passages that represent the type of expository discourse to be taught.
2. Prepare the graphic organizer.
3. Introduce the graphic organizer to the students.
4. Using only the graphic organizer, have the students reconstruct the passage in writing.
5. Have the students compare their passages with the original version.

Camels in the Desert
(from McGee and Richgels, 1985)

Camels are still ridden by the people of the desert today. They are well suited for carrying people and heavy burdens for long distances in hot, dry places because they can go for a long time without water. As a result of their thick hooves, camels can easily walk on the hot sand. Finally, camels can live off the desert because they are able to find even the smallest plant to eat hidden in the desert soil.

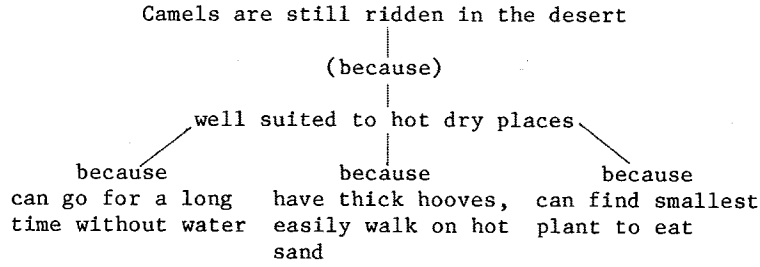

Figure 2

The use of this strategy assists students in being able to conceptualize the logical relationships within the text. The question arises, does instructing students in the hierarchical structure of expository text aid their comprehension of such texts. Research suggests that it can. Taylor and Beach (1984) found that developing in students an awareness of text structure aided their comprehension of unfamiliar social studies passages, although it had little bearing on their processing of familiar material. Another important strategy is the use of writing to enhance student awareness of text structures.

Writing

Van Nostrand (1979), who is interested in helping students understand social studies texts, proposes writing as a means of developing an understanding of the relationships in such texts.

> Composing consists of joining bits of information into relationships, many of which have never existed until the composer utters them. Simply by writing--that is, by composing information--you become aware of the connections you make, and you thereby know more than you knew before starting to write. In its broadest sense, knowledge is an awareness of relationships among pieces of information. As you compose, your new knowledge is your awareness of those relationships...No matter what the subject, no matter how much you might already know about it, simply writing about that subject will cause you to gain a new awareness of how the fragments of information about that subject relate to each other. This awareness is new knowledge (p. 178).

Van Nostrand contends that: 1) "the act of writing actually engenders new information, which the writer may or may not have perceived at the beginning"; and 2) "the semantic value of information in any series of assertions is dependent on the way the information fragments are combined" (p. 180). An example based on the work of Young, Becker and Pike (1970) may be helpful. Students in a teaching methods class for content reading were asked to write a descriptive paragraph about fall (Kent,

unpublished). The results were evaluated holistically and were also analyzed using Pike's concepts of particle, wave, and field. Those paragraphs which were preferred by the majority of readers incorporated all three: particle, wave, and field. A sentence from one of the paragraphs may serve as an example, "Fall is a time for football with noisy, cheering crowds clapping with one hand and holding a mustard-dripping hotdog with the other." Here we see a glimpse of a total football game [field], the dynamic event of the cheering crowd [wave], and at the same time the very particular piece of information that there is mustard dripping off a hotdog [particle]. The juxtaposition of these items in one sentence creates a new picture for the reader. The way information is combined is definitely important to the writer as well as to the reader.

Emig (1977) similarly shares the view that, "The medium then of written verbal language requires the establishment of systematic connections and relationships. Clear writing by definition is that writing which signals without ambiguity the nature of conceptual relationships, whether they be coordinate, subordinate, superordinate, causal, or something other" (p.126).

Newell (1984) found that when students were asked to write an essay about an expository passage, they remembered significantly more than when they either took notes or answered study questions. He contends that this is because, "Essay writing...requires that the writers, in the course of examining evidence and marshalling ideas, integrate elements of the prose passage into their knowledge of the topic rather than leaving the information in isolated bits" (p. 282).

As we saw earlier, writing is also a strong component of McGee and Richgels' (1985) use of graphic organizers. They propose that one of the best means of making students aware of the structures authors use is to provide opportunities for them to become authors themselves, thus they incorporate the writing component into step 4 of their teaching strategy.

In summary, we see that both graphic organizers of text and the writing process itself enable students to better understand expository texts. Since, as Longacre (1976) has observed, expository texts have logical linkage, strategies which help the student focus on those logical ties, lead to better comprehension. Authors know a great deal about how to construct expository text. Linguists know a great deal from their analysis of such texts. Students need to know much of this same information. Therefore linguists have a responsibility to make explicit those things students need to know not only for English, but for other languages around the world.

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THE LAYERING OF IMPLICATURE IN THE BOOK OF JOB

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Introduction

Whenever I read the book of Job*, even in a modern English translation, I find myself muttering, "Now what's he driving at?" or "What's that got to do with the last thing he said?" Even when individual sentences are clear (which is often not the case), the direction or "gist" of paragraphs and sections may be obscure.

If I as a first-language speaker of English find it so, I feel concerned for the translators who use English as a basis for their work, and for whom English is a second language. Two areas of intensive study in recent years offer some hope for new approaches to this problem: 1) text linguistics and 2) pragmatics. Within these disciplines, some of the areas of research which, it seems to me, can help sort out the opacity of Job for many readers are:

1) studies of background knowledge of speakers and hearers, including cultural assumptions
2) acceptability of texts
3) reader/hearer strategies in deciphering texts
4) intertextuality: what readers expect because of their familiarity with other texts in the genre
5) intentionality of speakers/writers and its reflection in cohesion and coherence of texts
6) speech acts: what a speaker is trying to do by means of speaking.

Each of the above, in some way or another, involves implicature of some kind, and it is that topic we will focus on primarily in this paper.

Application to the Book of Job

We take for our study a sample from the second round of the debate in Job. In the first round, Job has denied the accusations of his so-called "friends," defended his integrity, and ended with a discourse on

* the first of several books of the Bible known as "Wisdom Literature."

the weakness of human beings. Now the three friends renew the attack, each attack being followed by a rebuttal from Job.

In the following presentation, we give the text in four versions: the Revised Standard Version (RSV), a text which preserves the sentence structure and rhetorical devices of the Hebrew fairly formally; the Jerusalem Bible (JB); the Good News Bible (GNB), a translation based on the principles of "common language" and "dynamic equivalence;"* and the Living Bible (LB), also dynamic equivalence but more idiomatic and more freely "paraphrastic." Space does not permit us to present three others: the New English Bible (NEB), the New International Version (NIV), and the Berkeley Translation (BRK), although all are included in the discussion.

Our procedure is, first, to determine the rhetorical devices used and get "behind them" to the basic information. Then we determine the implications, the illocutionary force (if it is not evident), and the deictic material which, in normal conversational discourse, serves to give the participants their "bearings."

The limitations of space permit us to deal with only a few of the jewels we find in this text. There are numerous other points at which implicature creates problems of understanding in the text; we will focus in particular on the implicature of rhetorical questions. For a start, let us note first of all how the communicational situation is depicted (Job 15:1):

RSV	JB
1 Then Eliphaz the Temanite answered:	The Second Cycle of Speeches 1 Eliphaz of Teman spoke next. He said:
GNB	**LB**
The Second Dialogue 1 Eliphaz	1 The Answer of Eliphaz the Temanite:

In the Hebrew text, the speaker, but not the addressee, is explicit. RSV and LB, by using the word "answer," indicate that a verbal exchange is going on. NIV, NEB, and BRK also follow this tack. GNB puts the material into the form of a heading. JB does both. Only GNB indicates the addressee (see v 2, below). As the previous reference to Job is three chapters back,

* For an explication of these principles see Nida and Taber's Theory and Practice of Translation.

this is a useful adjustment in the interest of clarity. In fact, as the "speeches" are, in general, very long, it would be effective for communication to refer to the addressee by name in the text periodically.

We come, in vv 2-3 to examples of the most prominent rhetorical features in Job, namely parallelism and rhetorical questions.

RSV	JB
2 Should a wise man answer with windy knowledge and fill himself with the east wind?	2 Does a wise man answer with airy reasonings, or feed himself on an east wind?
3 Should he argue in unprofitable talk, or in words with which he can do no good?	3 Does he defend himself with empty talk and ineffectual wordiness?

GNB	LB
2 Empty words, Job! Empty words!	2 You are supposed to be a wise man, and yet you give us all this foolish talk. You are nothing but a windbag.
3 No wise man would talk the way you do or defend himself with such meaningless words.	3 It isn't right to speak so foolishly. What good do such words do?

In terms of communication, the parallelism may provide useful redundancy--unless, of course, readers are unused to such a feature in discourse. (This is where intertextuality comes in.) In such a case, they may look for some new and different meaning in the second member of the set.

Rhetorical questions (RQ's from now on) pose a more difficult problem, as they are often ambiguous and are used in different ways in different languages.

First, let us examine briefly how rhetorical questions involve "implicature."

According to Levinson (1983, p. 110), RQ's represent an example of implicature generated by the flouting of one of Grice's "maxims" of human verbal interaction, namely the maxim of "sincerity" or "quality." Briefly stated, the maxim states that the speaker must be sincere to "play the game;" no lies, no made-up claims. In an ordinary conversation, then, a question is assumed to be a request for information; when it becomes evident to the addressee that the "information" in question is already well known to both of them, he infers that the speaker must be deliberately flouting the expected pattern, and thereby doing something else, namely emphasizing a point. In translation such an emphasis may need to be expressed in some languages as

a strong affirmative. This is what is attempted in GNB and LB in v 2-3 above, whereas all the rest preserve the RQ form. (Note that GNB also demetaphorizes the verse and brings "wise man" down from v 2 into v 3.)

We skip here the implications of the conjunctions in vv 4-5 and move on to the rhetorical questions in vv 7-9.

RSV	JB
7 Are you the first man that was born? Or were you brought forth before the hills?	7 Are you the first born of the human race, brought into the world before the hills?
8 Have you listened in the council of God? And do you limit wisdom to yourself?	8 Have you been a listener at God's council or established a monopoly of wisdom?
9 What do you know that we do not know? What do you understand that is not clear to us?	9 What knowledge have you that we have not, what understanding that is not ours too?

GNB	LB
7 Do you think you were the first man born? Were you there when God made the mountains?	7 Are you the wisest man alive? Were you born before the hills were
8 Did you overhear the plans God made? Does human wisdom belong to you alone?	8 made? Have you heard the secret counsel of God? Are you called into his council room? Do you have a monopoly
9 There is nothing you know that we don't know.	9 on wisdom? What do you understand that we don't?

Of the six RQ's here, all are preserved intact in NIV, JB, NEB, BRK, and LB. GNB converts the last two to a statement. Back-transforming these sentences, we get the following:

7 You are not the first man born.
You were not born before the hills.

8 You have not listened in God's council.
You limit wisdom to yourself.

9 You know nothing that we don't know.

Let us now penetrate these "converted RQ's" a little more deeply. The implications are stated in the right-hand column:

7 You are not the first man born. You were not born before the hills.	you are young
8 You have not listened in God's council. You limit wisdom to yourself.	you are ignorant you consider yourself wise
9 You know nothing that we don't know.	we know more than you do

Verse 10, dropping the RQ, carries on the same theme:

RSV	JB
10 Both the gray-haired and the aged are among us, older than your father.	10 A gray-haired man and an ancient, are of our number; these have seen more summers than your father.

GNB	LB
10 We learned our wisdom from gray-haired men--men born before your father.	10 On our side are aged men much older than your father.

The statements here are at the same level with our "back transformations" of vv 7-9. The implication is: "We are old" which balances "you are young" above (v 7).

At this point we can detect a still deeper level of inference in the text--a level which, depending on the intended receptors, could be made explicit in translation: By saying " ou are young" (v 7), the Hebrew cultural background almost certainly supplies "You are foolish" (note LB v 7). Likewise, "We are old" (v 10) implies: "We are wise." An adequate translation of this into any language should be based on a prior decision as to whether or not the linkage between old age and wisdom is culturally assumed.

Further, "You consider yourself the only wise person" (v 8) implies "You're proud" and probably "You think we're stupid."

Furthermore, in both references to the age factor (vv 7 and 10) there is the inference: "(Since we are wise and you are foolish) you ought to listen to us." Most translators, however, are not comfortable with making such implied material explicit.

We have noted here that there are different levels, or stages, of implication. We could perhaps delineate them thus:

1) the rhetorical, in which the negative/positive polarity is reversed

2) the conventional (cultural?), in which a connection is made between a physical state (old or young), or an attitude (You limit wisdom to yourself) and a mental state (wise, foolish, or proud).

3) the pragmatic, in which the conclusion is drawn that certain behavior should follow from certain conditions.

It is possible that this "layering" of inference accounts for much of the opacity of the book of Job.

We continue with more RQ's in vv 11-13.

RSV	JB
11 Are the consolations of God too small for you or the word that deals gently with you?	11 Do you scorn the comfort that God gives, and the moderation we have used in speaking?
12 Why does your heart carry you away, and why do your eyes flash,	12 See how passion carries you away! How evil you
13 that you turn your spirit against God, and let such words go out of your mouth?	13 look, when you thus loose your anger on God and utter speeches such as these!

GNB	LB
11 God offers you comfort; why still reject it? We have spoken for him with calm, even words.	11 Is God's comfort too little for you? Is his gentleness too rough?
12 But you are excited and glare at us in anger.	12 What is this you are doing, getting carried away by your anger, with flashing eyes?
13 You are angry with God and denounce him.	13 And you turn against God and say all these things against him.

The major translations preserve the double RQ form in v 11, although GNB splits the first part and converts the second part to a statement. At least two layers of implication are present here:

1) The consolations of God are too small for you.
2) You reject God's consolations.

Here Eliphaz accuses Job of rejecting God's comfort. The conventional implication is: "You are proud." Such an implication could be made explicit in a translation such as the following:

Tell me, Job, are **you too proud to receive the** consolation God offers you?

or, transforming the RQ to a statement,

> Job, you're just too proud to receive comfort from God.

In verse 12 the ad hominem arguments continue, this time clad in idiom ("Your heart carries you away") and a culturally significant act ("Your eyes flash"). It is perhaps this extra rhetorical load that induced the GNB translators to convert the RQ's to statements:

> ...you are excited and glare at us in anger

whereas LB converts the RQ thus:

> What is this that you are doing, getting carried away by your anger, with flashing eyes?

and JB uses an exclamatory sentence:

> See how passion carries you away!
> How evil you look...

Eliphaz now makes an assertion about human morality:

RSV	JB
14 What is man, that he can be clean? or he that is born of a woman?	14 How can any man be clean? Born of woman, can he ever be good?
GNB	**LB**
14 Can any man be really pure? Can anyone be right with God?	14 What man in all the earth can be as pure and righteous as you claim to be?

Once again we have ambiguous RQ's. All the versions have preserved the RQ form however, perhaps because the question is answered explicitly in vv 15-16 with a resounding "No!" When the first layer of implication is "peeled off", the result (No one is perfect) carries a further implication: "and that includes you, Job." Beyond that, we detect yet another: "You claim to be perfect." Note that LB makes the inner implication explicit.

We pass over a routine piece of implicature involving "not even...much less" in vv 15-16, and an excursus on the fate of godless people (including a chiasm in v 20), in order to consider Job's reply to Eliphaz.

RSV

16:1 Then Job answered:

2 I have heard many such things;
miserable comforters are you all.

3 Shall windy words have an end?
Or what provokes you that you answer?

JB

16:1 Job spoke next. He said:

2 How often have I heard all this before! What sorry comforters you are! Is there never to be an end of airy words? What a plague your need to have the last word is!

GNB

1-2 I have heard words like that before;
the comfort you give is only torment.

3 Are you going to keep on talking forever?
Do you always have to have the last word?

LB

1 JOB'S REPLY:

2 I have heard all this before. What miserable comforters all

3 of you are! Won't you ever stop your flow of foolish words? What have I said that makes you speak so endlessly?

Note the levels of implication in v 2:

I've heard such things before.

⇒ Your words are not new.
⇒ Your words are not helping me.

It is easy to see how at the third level, the meaning becomes more obviously parallel to the second part of the verse: "Miserable comforters are you all" (i.e., your "comfort" is ineffective).

The following verse (v 3) breaks down as follows:

1) Shall windy words have an end?
2) Your windy words seem to be endless.
3) You're going on and on and it is useless.

A further level probably is: "I don't like it, "and/or "I wish you would quit."

In v 3b it is instructive to note the variation between JB and GNB.

JB: What a plague your need to have the last word is!
GNB: Do you always have to have the last word?

This raises a point about the comprehension of texts.

It has been pointed out that texts which abound in verbal nouns are more difficult to read than texts in which there are few verbal nouns. That is, when

semantic events in a text are realized by verbs and semantic "objects" by nouns, the text is usually easier to read. In other words, there is a sort of natural match:

grammar:	verb	noun	adjective
semantics:	event	object	abstract

Speakers and writers "cross categories" (transform "arrive" to "arrival," for example) in order to be more concise or for literary effect. When they do so, however, the level of difficulty goes up.

The same "natural matching" may be true of pragmatic categories over against sentence types:

grammar	interrogative	imperative	declarative
pragmatics	question	order	assertion

A person may pose a question in the grammatical form of a declarative or exclamatory sentence; assertions may be made in the form of questions (i.e. rhetorical questions). When this is done, however, the level of difficulty goes up.

I suggest the following hypothesis: the closer the match between grammatical sentence types and their corresponding "natural" pragmatic category (e.g. grammatical "interrogative" and pragmatic "question"), the more quickly the text will be understood.

Conclusion

The Book of Job illustrates the wide variety of rhetorical devices and discourse features that are present in many of the Hebrew Scriptures. Translating these devices literally may give us a picture of the way the Jewish writers used language, but for many readers much of the meaning is lost because their own literary tradition uses different devices (or the same devices for different ends). It may also be true that the use of literary devices in drastically different frequencies creates loss of impact because of differences in expectations. Finally, loss of meaning and impact may be due to inability of readers to pick out the "thread of discourse" due to the heavy use of rhetorical devices and sheer "footage" of text.

In this paper we have examined how some of these issues (particularly rhetorical questions) have been dealt with in the modern English versions. In the process of doing so I hope we have raised some issues that will provide grist for further inquiries regarding equivalence between languages. Some unanswered questions are these: What aspects of form (if any) should we try to preserve in translation? What is "poetical"

meaning? Is it transferrable? In religious literature is there a "spiritual" meaning distinct from the aesthetic and denotative/connotative meanings of the text? What are the limits to making explicit the implicature present in a literary text?

In addition, I believe we have here a challenge to our traditional methodology in translation. Our three-step approach (analysis into semantic "kernels," transfer, restructure) is inadequate for poetical materials like Job. I suggest that a new methodology be designed for such materials which will take "surface structure" as not only grammatical strings but as a representation of pragmatic, illocutionary, and rhetorical structures as well.

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ANALYSE STATISTIQUE DES PROPOSITIONS DANS UN TEXTE: PROBLÈMES ET MÉTHODES

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En statistique linguistique on éprouve beaucoup de difficulté à traiter les phénomènes sémantiques et à en faire des paramètres de description au même titre que les données phonétiques, le vocabulaire ou les structures syntaxiques. On se rend vite compte qu'on est en face d'éléments qui par nature sont loin d'être des unités discrètes, dénombrables. En dépit des apparences, une notion comme celle de la "proposition" reste floue, même si on en connaît l'importance en logique et dans toutes les sciences de langage, qu'elle a été mille fois définie par les plus grands penseurs en même temps qu'elle faisait l'objet de manipulations quotidiennes dans les exercices scolaires. Ce n'est pas une simple question de confusion terminologique. Il ne s'agit pas non plus du seul problème des saisies différentes et légitimes d'un même concept par plusieurs disciplines pour l'adapter à leurs propres besoins. Tous ces problèmes sont présents dès qu'on parle de la "proposition" que nous définissons provisoirement, dans sa forme la plus générale et la plus simple, comme étant **toute suite linguistique constituée d'un élément prédicatif en relation avec un ou plusieurs arguments.** Mais ce qui nous préoccupe maintenant c'est de voir s'il est utile et possible d'en faire une étude statistique dans le cadre des analyses du discours. Notre exposé comporte trois points: 1) l'intérêt d'une telle démarche, 2) les problèmes méthodologiques à surmonter dans l'établissement des données, 3) la recherche de formules statistiques appropriées. Les exemples que nous donnons sont pour la plupart tirés d'un court récit de John Steinbeck **The Affair at 7 rue de M.** (texte original et traduction française), et d'un extrait du **Nouvel esprit scientifique** de Gaston Bachelard. -Voir résumés en annexe. Nous y référons par les abréviations JSA (John Steinbeck, en anglais) JBF (traduction française), GB (Bachelard). A ce stade de la recherche on comprendra que nous n'avons ni résultats mirobolants ni conclusions définitives à présenter. Il y a encore trop de problèmes de fond dont la solution exige une longue réflexion et de nombreuses vérifications.

1. A quoi serviront les calculs statistiques des "propositions"?

On pourrait profiter de cette question pour s'interroger sur les buts et l'utilité de la statistique linguistique tout court. Nous préférons prendre pour acquis que cette approche

n'a plus besoin de démontrer sa contribution aux sciences du langage autant en théorie que dans des applications. Cela dit, voici quelques problèmes qui bénéficieraient d'une description statistique de la "proposition".

1.1 Les linguistes ont été très vite surpris et frustrés de découvrir que la théorie de l'information, toute séduisante qu'elle soit, n'a rien à voir de près ou de loin avec le calcul du sens ni avec le sémantique tout court. Bar-Hillel, dans **"An Outline of a Theory of Semantic Information"** (1952, 1964) a bien rappelé les limites de cette théorie: «Prevailing theory of communication (or transmission of information) deliberately neglects the aspects of communication, i.e. the meaning of the message» (1964, p.221). Pour notre part nous trouvons intéressants ces travaux dans la mesure où ils visent le calcul du contenu et la mesure de l'information sémantique, d'une part, et d'autre part, prennent comme concepts de base la phrase et la proposition - ce qui tombe directement dans le champ de nos préoccupations. Cela ne signifie pas que les formules developpées par Bar-Hillel sont immédiatement applicables au discours de tous les jours. Nous voulions seulement montrer en rappellant ces travaux déjà anciens que les calculs statistiques des propositions répondent depuis longtemps à un intérêt scientifique d'un niveau qui dépasse les modestes manipulations auxquelles nous nous livrons habituellement.

1.2 Une telle approche devrait permettre de décrire plus adéquatement certaines perceptions empiriques concernant la **typologie textuelle.** Y a-t-il des corrélations nettes entre le poids relatif (fréquence pondérée) des types de propositions et les différents types de texte? Par exemple nous avons d'un côté ce texte de Steinbeck que notre compétence de lecteur nous fait classer comme un récit, un texte de fiction, ou au moins comme une relation d'expérience intéressante et vraisemblable. D'un autre côté le texte de Bachelard peut être classé comme un texte de réflexion, de discussion, d'argumentation. Sur quoi sont fondées ces distinctions? Indépendamment du classement traditionnel des genres et des facteurs purement pragmatiques (conditions d'énonciation, condition de réception ou de lecture), nous constatons que dans les récits, il y a prédominance des propositions avec les contenus

X agit sur Y
X fait quelque chose dans un but Z
X a la propriété ou la caractéristique A

dans lesquelles la véracité du contenu (ce qui est ou qu'on croit être la vérité) n'est pas formellement remise en cause, que ce soit de façon explicite ou implicite. C'est le cas dans les exemples suivants:

«This young man as, during the last several years in America,

become not so much an addict as an aficionado of that curious American practice, the chewing of bubble gum, and one of the pleasanter aspects of the early summer in Paris lay in the fact that the Cadet John has neglected to bring any of the atrocious substance with him from America. The child's speech became clear and unobstructed and the hypnotized look went out of his eyes.»(JSA, pr 36 à 40).

Par contre dans le texte de Bachelard on relève entre autres les propositions implicatives (si p alors q), et quelles qu'elles soient, les assertions sont en général accompagnées d'un autre type de proposition formulée par des verbes de jugement ou d'opinion.

«*Si l'on nous accorde un instant que les règles cartésiennes pour la direction de l'esprit ne conviennent plus aux multiples exigences de la recherche scientifique tant théorique qu'expérimentale, on ne manquera pas cependant de nous objecter que règles et conseils gardent sans doute une valeur pédagogique.*» (GB, pr 1 à 4).

Nous avons parlé de prédominance de types de propositions. L'intérêt d'une étude statistique est de substituer à cette saisie intuitive et grossière une mesure plus rigoureuse.

1.3 Parmi les problèmes cruciaux qui se posent à la **linguistique textuelle** il y a celui de rendre plus objectives les "procédures de découvertes" qui permettent **d'identifier les différents actants du texte,** leurs rôles respectifs, et d'établir le cas échéant une hiérarchie. Tout en reconnaissant l'importance des schèmes structurels et qualitatifs dans une telle démarche, je crois qu'on gagnerait à examiner de plus près l'influence de la syntaxe de la proposition (l'ordre des arguments) et le cumul des informations de cette nature (effet de fréquence) sur la construction progressive que fait le lecteur de la structure du texte. Si l'on part des exemples donnés ci-dessus (JSA, pr 36 à 40), le "héros" peut être à priori Cadet John, la gomme ou tout autre élément qui occupe la fonction d'argument dans n'importe qu'elle proposition. Si Cadet John l'emporte c'est à cause de la fréquence et de celle de ses coréférents. C'est aussi à cause de sa position comme premier argument (disons le sujet syntaxique) dans au moins deux des propositions. Mais plus loin dans le texte on a cette séquence:

«*"Oh sir" he moaned, "I really didn't. I'm not chewing it (the gum), sir. It's chewing me."*» (JSA, pr 97 à 100);

la gomme gagne du terrain comme "héros" ou personnage principal à cause du renversement de l'ordre des arguments - évidemment accentué par l'opposition emphatique. On peut appliquer la même analyse au texte de Bachelard et se rendre compte que le **Discours de la méthode** et ses équivalents sémantiques (règles

cartésiennes, leçon cartésienne, etc.) en constituent le thème principal - ils apparaissent comme argument dans environ 20 propositions sur une cinquantaine que contient le texte, et dans la majorité des cas ils sont en position sujet.

Il y donc lieu de travailler l'hypothèse selon laquelle la position "sujet-agent" est beaucoup plus forte que les autres dans l'interprétation globale des discours et influence en sa faveur la hiérarchisation des éléments d'information.

1.4 Enfin des notions comme celles de cohérence et de **cohésion textuelle** gagneraient en précision si on les étudiait sur la base de relations interpropositionnelles et non seulement interphrastiques. Nous avons proposé ailleurs certaines formules pour le calcul de la cohésion lexico-sémantique (Ménard 1980, 1986). Il va sans dire qu'une mesure globale de cette propriété du texte doit aussi intégrer parmi ses composantes principales des indices qui expriment les relations plus ou moins étroites que les propositions dans leur forme et dans leur contenu entretiennent entre elles. Le succès d'une telle opération contribuerait à rendre plus objectives les comparaisons entre deux textes dont l'une est la traduction, la paraphrase, la réécriture ou même le résumé de l'autre.

2. Problèmes méthodologiques.

Les obstacles à la poursuite de tels objectifs tiennent principalement à la structure de la proposition et à la complexité de ses manifestations en langue naturelle. L'appareil descriptif le plus puissant et le plus utile nous semble être celui de Mel'čuk et col., même si le travail d'analyse des prédicats que l'on retrouve dans leurs dictionnaires est long, ardu, et que les autres composantes qui rentrent dans la représentation sémantique demeurent encore au niveau des postulats ou à tout le moins sont illustrées par des exemples ad hoc. Voici les principaux problèmes qui se posent:

2.1 Portée limitée des modèles hautement formalisés.

L'exemple le plus frappant est celui du calcul des prédicats de la logique classique. Les linguistes en retiennent en général les deux quantificateurs (existenciel et universel), les modalités (nécessité et possibilité), les 8 opérateurs - et leurs contraires- autour desquels s'articule l'étude des relations dont les plus "sollicitées" sont celles d'équivalence, de conjonction, de disjonction et d'implication. Si l'on ne manque jamais de constater le peu de rendement d'un tel modèle dans l'analyse de langue naturelle, il demeure que tous les éléments de ce système sont récupérables et sont en général intégrés dans des modèles plus récents. Il faut dire d'ailleurs que même une analyse approfondie comme celle de Katz (1977) se limite aux phrases assertives et aux propositions simples. On remarquera quand même que la plupart des connecteurs logiques

ont des liens avec les conjonctions (de coordination, de subordination) de la grammaire pédagogique. Les approches intuitives y trouvent leur compte, surtout quand on parvient à détecter les ambiguités et les analogies trompeuses.

Pour illustrer notre propos, prenons les exemples suivants:

> «*Ainsi, d'après l'expérience qu'a pu nous fournir l'enseignement élémentaire de la Physique et la Philosophie, on ne réussit pas à intéresser de jeunes esprits à la méthode cartésienne*». (GB, pr 30-31).

Les moyens de la logique classique sont trop rudimentaires pour représenter toutes les relations et les modalités impliquées dans cette phrase, et si on arrive à quelque chose d'approximatif le coût de l'opération serait trop élevé.

Mais les solutions des grammairiens nous déroutent tout autant, à cause des divergences d'opinion face à la "proposition infinitive". Ainsi pour le Bidois il y aurait ici 3 propositions dont l'une infinitive (avec "intéresser"). Wagner et Pinchon ne reconnaissent pas officiellement la proposition infinitive et même dans les cas extrêmes après un verbe de perception (ex: Il voit les nuages courir), parlent de "proposition instable" selon la terminologie de Bonnard. G.R. Roy (1976) n'y verrait que des verbes composés ("pouvoir" et "réussir" sont des coverbes), ce qui donne lieu à deux propositions seulement.

Les problèmes analogues se posent pour le statut des propositions attributives où le verbe copule est effacé et avec les gérondifs:

> «*In the light of impending publicity, I think it only fair to issue the true details...*» (JSA, pr 11.12)

> «*Vu la publicité dont va désormais être entourée cette affaire, je pense qu'il est normal de faire connaître les vrais détails...*» (JSF, pr 11 à 13)

La comparaison de l'original et de la traduction montre bien que les critères purement formels (syntaxiques) pour délimiter les propositions ne s'accordent pas forcément avec les critères sémantiques, et les contraintes idiomatiques et stylistiques d'une langue à l'autre ne font qu'accentuer le problème:

> «*...that curious American practice, the chewing of bubble gum, ...*» (JSA, pr 36)

> «*...cette curieuse pratique (?) américaine qui consiste à mâcher du bubble gum...*» (JSF, pr 37-38)

> «*Since I do not believe in inhibiting my children...*» (JSA, pr 51-52)

«Comme je ne pense pas qu'il faille donner des complexes à mes enfants...» (JSF, pr 50-51)

2.2 Proposition syntaxique ou proposition sémantique?

Même si nous avons d'emblée défini la proposition à partir du prédicat et des arguments, nous avons maintenu dans l'examen des données une certaine confusion, et à dessein. D'une part cette confusion a toujours existé à cause des interférences inévitables entre syntaxe et sémantique. Ce n'est pas sans raison qu'une "sémantique générative" a doublé la théorie standard. Deuxièmement, l'analyse linguistique du discours est obligée de prendre comme point de départ la structure de surface du texte et d'y coller autant que possible. Troisièmement dans l'analyse automatique ou semi-automatique des textes, il est beaucoup plus économique de repérer un verbe conjugué ou un groupe verbal qu'un prédicat nominalisé ou adjectivé - c'est du moins le cas en français où il est plus commode de travailler avec les structures de phrases (SN + SV) tandis que, en dehors des définitions formalisées pour chaque lexème, aucune règle ne peut nous faire trouver le prédicat - cf les exemples classiques comme:

La potion de Tristan / La défection de Tristan

Du point de vue des analyses statistiques, le coût du traitement est un motif non négligeable dans le choix des méthodes. Et si nous parlons de "proposition syntaxique" c'est pour rappeler que, même dans les modèles de représentation sémantique assez élaborés, la structure syntaxique est omniprésente.

Malgré tout il est bon de rappeler que les phénomènes à étudier sont les "propositions sémantiques" et toute approche par d'autres structures ne doit être considérée que comme une stratégie. Par conséquent même si on part des propositions syntaxiques (phrases de base) il faut y apporter au fur et à mesure les corrections nécessaires.

2.3 Normes de dépouillement.

Même s'il est impossible d'examiner ou même d'énumérer tous les problèmes qui se posent à l'analyste, il est sage d'établir une norme de dépouillement, en sachant au départ qu'on ne peut éviter une part d'arbitraire. Les principales règles à observer sont les suivantes:

a) Accorder le statut de "proposition" à toutes les phrases de base qu'il est possible de reconstituer (et cela comprend les infinitives complétives ou en fonction sujet, à condition de pouvoir identifier au moins un argument actualisé voir e) plus loin -, et les participes présents du type gérondif.)

b) Accorder le statut de proposition à tout syntagme nominal commandé par un déverbal (verbe nominalisé) à condition qu'il y ait équivalence sémantique (en contexte) entre le nom et le verbe et qu'on puisse identifier au moins un argument actualisé.

c) Traiter les semi-auxiliaires (ou coverbes) comme des modalités - on trouvera dans G.R. Roy (1976) une analyse et une liste de 319 coverbes qui couvre pratiquement tous les cas en français. Ajoutons qu'on doit traiter de la même façon des propositions comme "Il faut que tu viennes" où "falloir" n'est qu'une modalité.

d) Les relatives dites déterminatives ou épithètes (équivalentes d'un complément de nom ou d'un SA) nous mettent dans un dilemme. Katz (1977, pages 12-13) considère "*John who eats cookies eats jam*" comme une phrase simple et définit le caractère complexe ou simple des "propositions" de façon analogue, c'est-à-dire par la présence ou l'absence de véritables connecteurs. Nous sommes tenté d'adopter ce point de vue, mais la frontière est parfois mince entre déterminatives et explicatives, et de plus ce serait au détriment des énoncés descriptifs.

e) Rétablir les arguments élidés on effacés dans le seul but d'éviter la répétition - que ce soit par contrainte syntaxique ou stylistique. Avec les infinitifs, les participes et les déverbaux, si aucun argument actualisé (lexème) ne peut être retrouvé, il vaudrait peut être mieux se demander si on est vraiment en présence d'un prédicat véritable. A mon avis il n'y a qu'une seule "proposition sémantique" dans des phrases comme

Fuir est honteux / On admire la discrétion.

La liste des décision à prendre est assez longue: elle inclut entre autres le traitement des comparatives, des verbes opérateurs tels que "*concerner, s'agir de, etc*", des verbes factitifs et performatifs (il faut distinguer les emplois où ils sont des signes ordinaires, à traiter donc comme les autres prédicats), les phrases dites nominales, celles à "sens passif", etc.

2.4 Typologie des propositions.

On a déjà fait des distinctions importantes entre le "type" et le "contenu" dans la structure des propositions. Nous y ajouterons l'ordre d'importance dans l'énoncé.

a) Les propositions de 1er ordre:

Il s'agit de celles dont le prédicat est un performatif ou qui a une force illocutoire (question, ordre) en situation réelle d'énonciation. Autrement dit l'importance de ces propositions s'explique aussi par des raisons pragmatiques.

b) Les propositions de 2e ordre:
Il s'agit de toutes les propositions normales des langues naturelles qu'elles soient simples ou en relations conjonctive, disjonctive, consécutive (conjonction non simultanée) avec une autre. Contenu: expression d'expérience, relation d'événement, d'actions, description de phénomènes, d'états, de sensations, attribution de propriétés, explicitation de rapports entre deux entités, etc. Sont aussi incluses les propositions du 1er ordre hors de leur situation réelle d'énonciation.

c) Les propositions de 3e ordre:
-Toute proposition **q** dont la vérité (ou la recevabilité) est conditionnée par une autre proposition **p**. C'est en général le cas des "propositions syntaxiques subordonnées", mais aussi des dépendances parataxiques. La relation est en général l'implication: Si **p** alors **q**.
-Toute proposition **q** exprimant des évaluations (jugement, modalité) sur une autre **p**, ou introduit une opinion, une requête, mais qui ne peut recevoir d'interprétation linguistique adéquate en l'absence de **p**. La plupart des "principales" des complétives sont en fait sémantiquement moins importantes que leurs subordonnées: «*(q) Je crois que (p) il va pleuvoir.*»
Du point de vue du poids informatif c'est **p** qui est important, **q** pouvant même être supprimé.

d) Les propositions de 4e ordre ou quasi-propositions:
Ce sont les propositions syntaxiques commandées uniquement par des contraintes de surface, des règles d'emphase, des choix stylistiques. C'est le cas avec les verbes opérateurs, certaines constructions impersonnelles (il demeure que) etc...

Ce classement est une première tentative pour pondérer les propositions dans les calculs. Il va sans dire qu'il connaîtra des modifications après discussions et expériences.

3. Les calculs.

3.1 Indice d'importance sémantique des propositions.
Quel que soit le classement des propositions (fait en fonction des hypothèses à vérifier), le calcul devait tenir compte
a) des effectifs des propositions f (pr.)
b) de leur importance relative.
En adaptant l'un des formules de Bar-Hillel suggérée pour rendre compte de la courbe décroissante du contenu de l'information, nous pouvons établir un **indice d'importance** (Ipr) des propositions

$$\mathbf{Ipr} = \overset{1^{er}\text{ ordre}}{f(pr)} + \overset{2^{e}\text{ ordre}}{\frac{f(pr)}{2!}} + \overset{3^{e}\text{ ordre}}{\frac{f(pr)}{3!}} + \ldots + \overset{k^{e}\text{ ordre}}{\frac{f(pr)}{k!}}$$

dans lequel f(pr) représente le total des propositions d'une

importance donnée et k le nombre de niveaux hiérarchiques qu'on a pu établir dans le texte. Vu que toutes les classes prédicatives (action, état, etc) sont susceptibles de former des propositions de tous les ordres d'importance, on peut alors caractériser les textes ou les parties de texte du point de vue du contenu. Si l'on compare alors le texte de Steinbeck avec celui de Bachelard on obtient comme indice Ipr

Contenu comparé	GB	JSF
Action	0.120	0.677
État (description)	0.330	0.188
jugement, opinion	0.580	0.044

Nous ne pouvons pas tirer de conclusions sur des données encore fragiles, toutefois elles ne remettent pas en question ce que nous connaissions empiriquement de ces textes. De même, si nous comparons la 1ère partie du JSF (le "prologue") avec le reste nous devons conclure que le prologue est un texte d'argumentation avec un Ipr de 0.310 contre 0.001 pour le reste.

3.2 Indice d'importance des actants.
Le même raisonnement peut s'appliquer aux actants du texte. Si l'on est d'accord pour classer les 1er, 2e, 3e arguments exprimés etc. dans une échelle analoque à celle des propositions, on aura à considérer pour chaque actant (a)

- sa fréquence relative dans le texte $\frac{f(a)}{N} = \frac{\text{occ. de a}}{\text{occ. de tous les actants}}$
- un coefficient e en fonction des prédicats
  $\frac{f(R_a)}{f(R)} = \frac{\text{nombre de prédicats dans lequel il apparait}}{\text{total des prédicats}}$
- une pondération selon sa place comme argument.

$$I_a = \frac{f(a)}{N} \times \left(\underset{1^{er}\text{arg.}}{\frac{f(R_a)}{f(R)}} + \underset{2^{e}\text{ arg.}}{\frac{f(R_a)}{f(R)\times 2!}} + \underset{3^{e}\text{ arg.}}{\frac{f(R_a)}{f(R)\times 3!}} + \ldots + \underset{k^{e}\text{ arg.}}{\frac{f(R_a)}{f(R)\times k!}} \right)$$

Si l'on compare l'importance relative de "Cadet John" et du "bubble gum" comme actant, les calculs nous donnent des I_a de 0.201 et de 0.332 respectivement, ce qui favorise "bubble gum".

Là s'arrêtent nos commentaires. Il est encore beaucoup trop tôt pour parler d'évaluation en probabilité et il faut s'attendre à des corrections mathématiques, d'autant plus qu'il faudra traiter un bon nombre de textes afin de voir si la courbe à laquelle nous avons "ajusté" l'importance des éléments par ordre décroissant vérifie toujours les classements obtenus empiriquement ou par d'autres voies.

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RÉSUMÉS

-JSF: Histoire "extraordinaire" d'un petit Américain, Cadet John, en vacances à Paris qui n'arrive pas à se débarasser de sa gomme à mâcher, en dépit de ses efforts personnels et de l'aide de sa famille. Cette gomme a comme pris possession de sa bouche et le force à mastiquer jour et nuit.

-GB: C'est la 3e partie d'un exposé sur l'épistémologie non cartésienne, où Bachelard essaie de montrer que même si le Discours de la Méthode n'a plus la même force dans la science moderne, il garde encore une influence qui peut être bénéfique.

VII

COMPUTATIONAL LINGUISTICS

THE FORM OF A MINIMAL PROCEDURAL GRAMMAR: i.e. A GRAMMAR FOR NATURAL LANGUAGE INTERACTION WITH A COMPUTER

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1. Prelude

In the Invited Lecture to LACUS four years ago (Fawcett 1983), I tried to show that Saussure's essential principles for understanding the nature of language lead directly to a particular - and markedly un-Chomskyan - way of modelling language: to the functional and relational network models of language such as tagmemic, stratificational and, in particular, systemic functional grammar (SFG). Naturally, I suggested that they lead most directly to the 'systemic semantic' version of SFG that I myself advocate (e.g. Fawcett 1980, in press); this has much in common with much of Michael Halliday's writings (but not all: see the discussion in Fawcett in press, section 1.1), with Michael Gregory's version of SFG (e.g. Gregory 1985), and shares common ground with Ilah Fleming's stratificational model. In a short 'tailpiece' section of that rather substantial paper, which one might easily overlook in a quick read, I suggested - and so far as I know it was for the first time - what has since increasingly struck me as a rather important distinction between two types of grammars: EXHAUSTIVE grammars and MINIMAL PROCEDURAL grammars.

My purpose here is to spell out this distinction, and to show that, if you accept it as valid, it may have some rather significant implications for how some people at least view the question of what constitutes the central business of linguistics. There is a danger here, because IF I am misunderstood and IF that misunderstanding catches on (as has happened before in linguistics) it could just possibly have the effect of putting hundreds of segmental phonologists out of a job - which is NOT my intention! (However, the supra-segmentalists, you will be relieved to hear, are safe - and in any case it should create hundreds of OTHER jobs in linguistics.) So an alternative and more provocative sub-title for this paper might have been 'the death of segmental phonology?'

2. The COMMUNAL project in computational linguistics

Let me begin by explaining how I became aware of the distinction. During the last few years I, like many others, have increasingly done much of my linguistic thinking in the framework of computational linguistics (CL). As a result I have in fact spent a lot of the last two years not in linguistic thinking directly, but in organising a consortium to support a major research project in this area. There will be three research teams: the largest will be

at the University of Wales Institute of Science and Technology, Cardiff (where I expect to move to), and there will be two smaller teams at the University of Leeds and at the Knowledge Engineering division of International Computers Ltd (ICL), Manchester, who are Britain's largest computer company.

The project's goal is to develop a system that will enable people who know very little about computers, and who may even be frightened of them, to interact naturally with the Fifth Generation machines that will soon be with us. In the next 5-15 years we shall increasingly find that computers contain - or are connected to - Intelligent Knowledge Based Systems (IKBSs), i.e. artificial intelligence (AI). For an intelligent computer to be genuinely 'user- friendly' it must be able to speak - or at least to write - in your own language, and to do this without drawing your attention all the time to the oddities in the way it is using the CODE of language (here English) - as so often happens in conversing with a non-native speaker of English, and as current systems tend to. This, then, is the ambitious goal of our project - as of many others around the world. It is called COMMUNAL, then, because it is a system for COnvivial Man-Machine UNderstanding through NAtural Language.

Let me now say a little about how our project will be different from other current projects. First, the project is more long-term than most in this field, and we are designing our system for the hardware that will be available 5-10 years ahead. This means that we shall assume machines with enormous memory capacity, with extremely rapid data accessing, and above all with PARALLEL PROCESSING - i.e. machines that can work on several problems at the same time.

Second - and related to the concept of parallel processing - is our choice of what model of language to use. Like the Nigel project of Mann and Matthiessen at the Information Sciences Institute of the Universtiy of Southern California, we shall be using SFG. If you know anything at all about this model, you will know that it models the structure of a unit such as the clause as reflecting sets of SIMULTANEOUS choices from the semantic options available in various FUNCTIONAL COMPONENTS: the EXPERIENTIAL, the LOGICAL, the INTERPERSONAL and the TEXTUAL, which includes both the THEMATIC and the INFORMATIONAL (cp. Halliday passim. e.g. 1985, and Fawcett passim, e.g.1980). Simultaneity of choice is in fact even more pervasive than this implies; in a reasonably full grammar it typically happens many times over in each functional component that the pathway through the network divides into two or more parallel pathways, each of which must be followed, so that when a speaker is making choices (normally quite unconsciously, of course) in the SYSTEM NETWORK that specifies the MEANING POTENTIAL of her/his language, s/he in involved in multiple parallel processing. It may therefore be the case, we suggest, that SFG is a theory whose time, with the advent of parallel processing in computers, has come.

Third, we are determined that in this project at least we shall not let the logical tail wag the linguistic dog. Normally in AI attention is focussed first upon 'knowledge' and the manipulation of knowledge (inferencing, etc), and only at the last moment, as it were, is an attempt made to make this intricate system available to the ordinary person, by tacking on a 'natural language front end'. We suggest that this approach, which can be regarded as working from the INSIDE ('knowledge' to the OUTSIDE (the language by which people communicate with each other) is truly an 'inside-out' approach - that they have got things the wrong way round, in effect. Our approach - and ICL deserve full credit for being willing to swim against the current in supporting it - is that what is needed is an 'outside-in' approach. This is essentially the application in CL of the ideas of Sapir and Whorf: that is, FIRST you build a good, rich model of language into your computer, and SECOND you ask about its relationship to 'knowledge'. (It is of course in practice a matter of logical, not temporal, priorities.) It may even turn out, we suggest, that we use our language (or at least the semantic stratum) for storing and thinking about what we 'know' - and indeed that we use our other semiotic systems (e.g. pictorial representation and music) for other areas of experience - though we shall not be trying to model these other semiotic systems at this stage.

The project has a number of other distinctive features, such as the inclusion of complex and explicit DISCOURSE GRAMMARS that operate 'above' the SENTENCE GRAMMAR in the production and analysis of discourse structure; the use of probabilities in sentence parsing and possibly generation; etc - but this will suffice for now.

Naturally, the future work on the project is based on pilot exploratory work - and it is this that has pointed up the distinction between EXHAUSTIVE and MINIMAL PROCEDURAL grammars. The perhaps almost shameful fact is that it has only been in facing up to the challenge of making a computer-implementable model of 'language in use' that I have come to appreciate the central fact with which we are concerned here about the nature of language. It is a discipline that I recommend to others!

3. The components of a model of language in an exhaustive grammar

First, let us be clear about the TYPE of distinction that we are concerned with. It is NOT the type associated with different models of language, such as the SFG model, the stratificational, the tagmemic, the categorial, the GPSG, the GB, the LFG, etc. It is one that cuts across these, so that both a GPSG grammar and an SFG grammar can either 'exhaustive' or 'minimal procedural'.

It may be helpful to re-phrase our question as follows: 'What components of a model of language are needed in (1) an exhaustive

grammar, and (2) a minimal procedural grammar?' In order to answer this we shall need to establish just what components we would include.

First, there is the question of discourse grammars and sentence grammars. It will be clear from what I said in section 2 that in my view a full model of a language must also include not only an adequate SENTENCE GRAMMAR but also DISCOURSE GRAMMARS. I use the plural, because we need both LOCAL DISCOURSE GRAMMARS, in a sense roughly equivalent to 'exchange structure' (Sinclair and Coulthard 1975, etc; but see also the 'systemic flowchart approach of Fawcett, van der Mije and van Wissen, forthcoming), and GENRE GRAMMARS, where different grammars are needed for the various genres such as narrative, casual conversation, service encounters, etc (see for example Hasan 1978 and Ventola in press). Here, however, I shall focus on the sentence grammar, because it is here that the distinction applies.

Let us consider the major phenomena that must be accounted for in a full sentence grammar of a language. As we make what is in effect a swift survey of much of the subject of linguistics, we shall not only specify the major COMPONENTS of a model of language, but also what it is that must be covered in an EXHAUSTIVE GRAMMAR. Thus, I would define an exhaustive grammar as one that specifies for a given (dialect of a) language (or, more realistically, seeks to specify) the PARADIGMATIC and SYNTAGMATIC potential (in the sense of 'potential' implied in Halliday's term 'meaning potential') of a language IN EVERY COMPONENT (or, more traditionally: 'at every level' of that language - but see further below). An exhaustive grammar of a LANGUAGE must include a full sociolinguistic account of its DIALECTAL VARIATION - geographical, class, age, ethnic, etc - and also of its variation according to situation, its REGISTER variation. *

Of course, this definition begs the question of how many levels a language has, and what they are. There could be at least the following (working from the bottom up): systematic phonetics (or whatever one chooses to call it), phonology, morphology, lexis, syntax, semantics, and possibly, for some, pragmatics (or some equivalent), with knowledge (or gnostology) beyond and outside language itself, for most linguists.

In Fawcett 1983, however, I argued, starting from Saussure's central concept of the sign - with its two complementary parts of

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* I ignore here the question of modelling the relative stability and instability of linguistic phenomena - i.e. LANGUAGE CHANGE. But it is certainly arguable that this too is part of an exhaustive account of a language - though not of a minimal procedural grammar: for the reasons see Fawcett 1983:67-8, on 'Diachronic and synchronic studies'.

'signified' and 'signifier' - that the two essential levels that every true semiotic system must have are the two for which the most convenient labels seem to be SEMANTICS and FORM. Every 'primary' semiotic system, I suggest, must offer contrasts at these two levels (see Fawcett 1884:147-50 for a typology of semiotic systems).

Typically - but by no means always in the case of language - these two sets of contrasts are in a one-to-one relationship. Thus, in a simple traffic light code, we say that a red light 'means' - or 'signifies' - 'stop', while a green signifies 'go'. The word 'stop', of course, when written in single quotation marks, is NOT a linguistic unit at the level of FORM, but a MEANING (a 'concept', in some terminologies).

While language generally TENDS TO conform to the principle of 'one form for one meaning', there are at any point in the development of any given language, as is well known, numerous exceptions. A simple example from LEXIS is the two meanings of the form light (which we could characterise informally as 'not heavy' and 'not dark'). One from MORPHOLOGY is the two realizations of the meaning 'plural' in the items cats and mice. One from SYNTAX is the two meanings of placing the clause element Subject after the element that I (following J.R. Firth) call the Operator (an element of clause structure; see Fawcett 1980:48, and compare Halliday's 1985:72 element Finite), as in (1) and (2). In (1) the meaning of

(1) Had you seen Ivy at the beach?

(2) Had you seen Ivy at the beach, you'd have saved a trip.

'Operator preceding Subject' (O + S) is something that we might gloss as 'seeking information', whereas in (2) O + S means something like 'hypotheticalness of proposition'. *

So far, we have collected the following components of a sentence grammar: SEMANTICS, LEXIS, MORPHOLOGY, and SYNTAX. For some scholars (for example, for much of the history of stratificational grammar), syntax, lexis and morphology are regarded as different LEVELS (or strata) of language. For those who still take this position, it may be interesting to consider the alternative view proposed here:

* I realise, of course, that some scholars would wish to assign to both of these examples a single meaning such as 'proposition unasserted', possibly with other elements of the clause realizing the semantic differences. While recognizing their reasons for doing so, I have found it difficult to make grammars whose semantic features are at such a high level of semantic (or is it conceptual?) generality actually work (i.e. function generatively). This may be another example - and a rather different type from those to be suggested below - of something that might be included in an EXHAUSTIVE grammar but which is not needed in a MINIMAL grammar.

namely, that while these are different COMPONENTS of the overall grammar, they are all on the same LEVEL. When you look at language, as was done in the days of the hegemony of behaviourism, 'from below' - i.e. from the phonological end - lexis seems patently more 'concrete' than syntax; after all, you can see a word on the page and hear it when it is spoken, whereas you can't see or hear syntax directly. This fact might suggest - though it is not self-evidently so - that they are at different 'levels'. But when you enter language 'from above' - i.e. from the semantic end - you find yourself with (1) a set of meanings (which might include, for example, instances such as 'not heavy', 'plural' and 'seeking information') which presumably all belong at the SAME LEVEL - i.e. at the SEMANTIC level, and (2) a variety of ways in which they may be realized. And it seems logical to model these three ways as being on the same 'level' - after all, they are all related to their meanings by the relationship of REALIZATION.

There are in fact THREE ways, and only three, in which the meanings of English are realized (and these are not quite the three exemplified above). Meanings are realized (1) in ITEMS (which includes morphology and lexis, in a sense of 'lexis' that includes 'grammatical' as well as 'lexical' items), (2) in SYNTAX, and (3), to introduce a realizational form that we have not mentioned so far, in INTONATION. *

Notice, then, that we are no longer treating 'phonology' in the traditional way as a unified component of our model of language (and so no longer as a single subject area within linguistics). This is because one part of it - intonation - realizes meanings directly, while the other does not. Moreover, the meanings realized in intonation are ones that are interdependent with ones that are realized in the syntax of the clause; many occur in the same system network, e.g that for MOOD.

Thus, while 'from below' phonology appears a unified subject, so that one may set up a rankscale, as Halliday has indeed done, of phoneme, syllable, foot, tone group, tone group complex and perhaps higher units (e.g. involving Brazil's concept of 'key'), the picture one has of language when viewed 'from above' is very different. From this angle PHONEMICS (phoneme structure), PHONOTACTICS (syllable structure) and INHERENT WORD STRESS (which is inherent in a word whether or or not it is activated in any given realization) can be seen to be types of linguistic patterning WHICH DO NOT DIRECTLY REALIZE MEANINGS.

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* By 'intonation', I mean those meaning-bearing prosodic contrasts that Halliday (e.g.1970) calls tone, tonicity and tonality.

Indeed, we should ask whether their relationship to ITEMS is, as is often assumed, one of 'realization'. I suggest that it is not the case that the various sub-components of segmental phonology REALIZE items, but that they SPECIFY them. That is, following Saussure, there is no such thing as a 'word'. A word is not a 'thing' but a RELATIONSHIP - a relationship between (1) a meaning (a superordinate part of which is the semantic correlate of its syntactic distribution, e.g. 'thing' for what we traditionally call 'nouns') and (2) the segmental phonology that realizes that meaning.

If one accepts this rather simple and basic idea, it follows that the relationship between what is already a realizational relationship and the part of it that we call 'segmental phonology' etc, cannot also be one of realization. In the model that I propose, a word is a relationship between a MEANING, as descibed above, and a CITATION FORM, - and the work that is done by segmental phonology, etc, is to SPECIFY the internal structure of that citation form.

This is why, in Figure 1 (Figure 7 of Fawcett 1983), we find what is essentially a bi-stratal model of language, with phonemics and phonotactics shown as PART OF, and not as the realization of, the ITEMS component of the level of FORM.

We have now added to our earlier list of components of a sentence grammar the following: INTONATION, SEGMENTAL PHONOLOGY (PHONEMICS, PHONOTACTICS, and INHERENT WORD STRESS) and, to relate semantics to the three components of items, syntax and intonation, A REALIZATION COMPONENT.

There are other aspects of language that could be included, such as our knowledge of the COLLOCATIONAL PROBABILITIES of items - and indeed of syntactic structures and intonational patterns - and so of the co-occurences of the various meanings that they realize. And far more could have been said about the semantics: the functional components mentioned in section 2, for example, and the nature of the system networks that are used in SFG (and indeed in the derived and still closely related parts of stratificational grammars).

4. Minimal procedural grammars

We are now in a position to answer the question: 'What is a minimal procedural grammar?' We begin with the term MINIMAL. It is minimal NOT in the sense that it covers a minimum of language, but in the sense that it includes only the MINIMUM NUMBER OF COMPONENTS that are needed when one seeks to construct a model of a natural language (such as English or Japanese) that will enable an artificial intelligence in a computer to produce - and preferably also

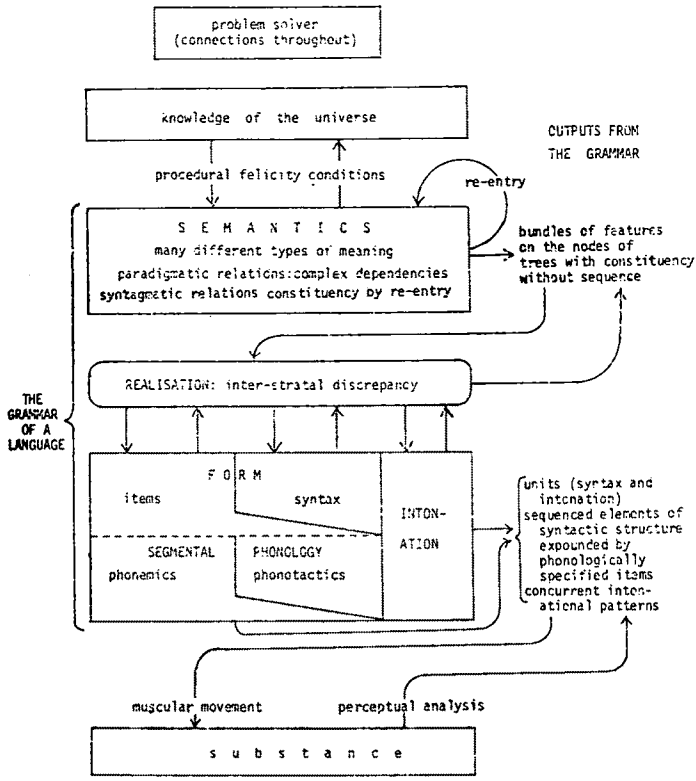

Figure 1: a representation of the grammar of English

understand - natural language texts. Such a grammar may in principle provide either a small or a large coverage of a language's full meaning potential.

How many of the components that we encountered in section 3 are needed for this purpose? The fact is that several - and they include the subject matter of a large part of many a linguistics course - are not. Those that are undoubtedly needed are the two essential levels of any semiotic system, SEMANTICS and FORM, and the REALIZATION COMPONENT that relates them. Within FORM we shall certainly need SYNTAX and ITEMS, and in any model with pretensions to completeness INTONATION too - even if the output is simply typed strings of words and punctuation. This is because even when we read a text silently, we read in the UNMARKED intonation with which it might be read aloud - and in so doing, we extract the TONICITY meanings of 'given' and 'new', etc, that the writer, quite unconsciously and often not very skilfully, has put into the text. (Indeed, one of the hardest part of editing a written text is to keep your implicit intonation appropiate.)

But what about the components of language that we suggested in the last section SPECIFY - rather than 'realize' - lexis? We must now say a little more about the form that ITEMS take in a CL model of language - and this is where the term PROCEDURAL enters the picture.

CL, unlike traditional linguistics, is concerned NOT simply with describing language in the abstract, but with language IN USE: in use in the GENERATION and PARSING of texts (in a sense of 'parsing' that involves working from strings of words and punctuation to the semantic representation of sentences). These terms are appropriate when the model is confined to the code of language itself; when that model is set within the framework of a model of a communicating mind, as in an AI model, with problem-solving and planning capacities of various kinds and discourse grammars, then it is more apprpriate to speak of the PRODUCTION and UNDERSTANDING of texts - as in the cases of the two seminal CL projects in each area, Winograd's UNDERSTANDING NATURAL LANGUAGE (1972) and Davey's DISCOURSE PRODUCTION (1978) (both of which, incidentally, used early systemic grammars). Let us consider the case of text generation/production. It helps to start here, since the semantics of language is NOT neutral in the issue that used to be discussed under the heading of 'directionality': the meanings that are built into the semantics of natural languages are very clearly the meanings of the PERFORMER (see Fawcett 1980:56), and a systemic functional model of language demonstrates this fully. This may be why many computational linguists working in text generation/ production have seen the value of SFG, whereas those working on parsing, which has been regarded as the harder problem, and so the main problem to solve, have not. 'How,' I have been asked by sceptical computational linguists,' does a system network help you to parse a sentence?' The answer is: 'Not directly, but

indirectly.' Clearly, if SFG is helpful in understanding how people produce texts, it must also be helpful in understanding how they understand them - because the meanings that the addressee is trying to extract from the text are (at a slight risk of oversimplifying) the meanings put into the text by the performer. Thus the semantic representation that is the real goal of a full parsing system - as opposed to one that merely seeks to construct some purely syntactic tree diagram - is equivalent to THE OUTPUT FROM THE CHOICES IN THE SEMANTIC SYSTEM NETWORK.

Our question about the place of ITEMS in a procedural grammar can therefore be re-expressed as 'How are items represented in a text generation or text production system?'. The answer is simple: if the output from the computer is to be in written form, the items are represented graphologically, and, if spoken, phonologically - initially in their CITATION FORM. This will include (1) a PHONEMIC REPRESENTATION of each item and (2) the marking of its INHERENT WORD STRESS. Notice that neither of these requires the provision of a full description of the relevant part of the language's phonology - and that PHONOTACTICS (syllable structure) is not mentioned at all. In some CL models the 'lexicon' is quite separate from the syntax, but in a full SFG model items, including semantically complex lexical items, are specified by semantic features in the more 'delicate' parts of the system network, such that a set of such features is realized in a given item, and spelled out either graphologically or phonemically, with inherent word stress (cp. Fawcett 1980:242-4).

4 Conclusions

I am suggesting, then, that in terms of constructing minimal procedural grammars, some components of language are necessary, while others are not. Modern linguistics began at the 'bottom' end of language, very sensibly, by studying what was relatively observable (the small units of phonetics and segmental phonology), and the subject developed by working 'upwards' - upwards in terms of both 'up the putative "levels"' of language and of 'up the rankscale of linguistic units' - through morphology to syntax and then up again to semantics and out to discourse. The more far-sighted scholars of those times, such as Bolinger, Firth, Hockett and Pike (three of whom, it should be noted, have served as President of this association), were always one or two jumps ahead of the game, and it is to them and their innovating successors such as Halliday and Lamb that we owe our freedom to range as widely as we do today across the broad phenomenon of language.

It will by now be clear that I am not advocating the abolition of segmental phonology. Indeed, it can be argued that, in a truly holistic procedural grammar the knowledge that a person has of the possible syllable structure and phonemic feature structure of

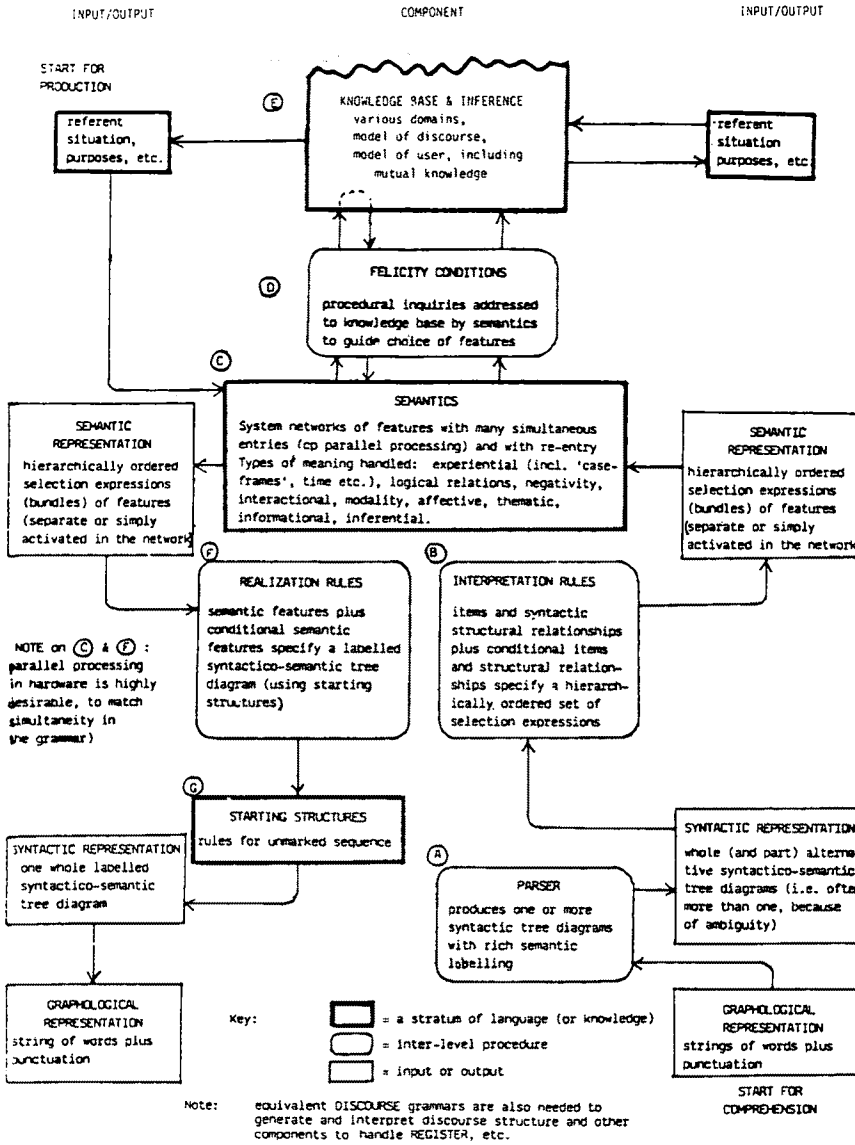

Figure 2: Overview of a systemic functional approach to modelling the production and comprehension of natural language sentences

her/his language, these components too would have some part to play. After all, isn't it true that, when we can't quite hear what is being said to us, we use our knowledge of what is and isn't allowed phonologically in our language to narrow down the possibilities? In any case, the study of segmental phonology is as worthy a pursuit as the study of any other phenomenon; however great my present involvement in the world of industry as I seek funds for the COMMUNAL project, I must, as a committed mountain climber as well as a committed student of language, recognise the urge to climb/study it 'because it's there'.

I hope it will nonetheless be clear that there is a clear difference between the 'optional extra' nature of these components in a procedural grammar, and the essential nature of SEMANTICS and FORM. It is not simply a question of contamination by commercial interests vs. the pure world of scholarship, because the essential question is, I think, to ask oneself: 'What is language for? Is it for sharing sounds with our fellow humans, or for sharing meanings?'

Finally, Figure 2 shows the components needed for a model of text production and comprehension, as seen from the viewpoint of CL. Note the addition of a parser. But to comment more fully would take another whole paper!

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A Computerized Model of Transduction

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This paper describes a preliminary version of a computer program that models the linguistic transduction of entire utterances. As it now exists, this preliminary model has two limitations: it only models upward transduction; and it does not model the transduction of an utterance through an entire language, but only through one part of a language, its graphonomy. But, within these limitations, this computer program is able to model the entire transduction of any ordinary utterance that can be produced in the English language. It may, therefore, be able to serve as a prototype for more extensive computerized models of transduction through language.

This computerized model of transduction differs from usual stratificational practice in five ways.

1. It processes entire transductions through one level at a time.

2. It models transduction in only one direction.

3. It does not use unmarked features.

4. It uses reticula to describe the relationships within all levels of language.

5. It uses basic cycles within the tactics.

Some of these differences are merely artifacts of computerizing this model; some of them may be of greater theoretical interest.

This computerized model includes subprograms (which are not described in this paper) that model perception at the graphic interface of language. These subprograms include all of the measurement procedures that are needed for perceiving the marks of written English, though all of these procedures are not needed for every such mark. These measurement procedures are applied at the graphic interface of English according to a measurement schedule like that described by Herrick (1984). They provide the facts about the marks of a written utterance that are then transduced through the linguistic network; the chilographemes correspond one-to-one to these facts.

Cindy

Figure 1. A graphic utterance.

Figure 1 shows the written text that will be used here as an example of an utterance to be transduced, and Figure 2 shows how this utterance is represented by this computer program during transduction. The program begins with a file that describes the entire utterance in terms of chilographemes.[1] The program reads this file of chilographemes, decides on the corresponding graphons, and writes those graphons, one by one, onto a file. Then the program reads the file (which it has just written) containing those graphons, decides on the corresponding graphemic signs, and

Description in terms of chilographemes

```
K  sort
CG wide-shape
CG no-loops
CG one-m-s-r-b
CG open-rightward
CG rounded-corner     orien-2v N
CG rounded-corner     orien-2v S
CG middle-handed
CG end-not-spread     orien-2v N
CG end-not-spread     orien-2v S
K  shape
CG no-gap
CG top-above
CG bottom-at
K  sort
CG narrow-shape
CG shallow-shape
K  shape              diacr    UP
CG narrow-shape
CG deep-shape
CG 1-curved-end       orien-2v N
CG crossed-end        orien-2v S
K  shape              diacr    DOWN
CG gap-above
CG top-above
CG bottom-at
K  sort
CG wide-shape
CG no-loops
CG one-m-s-r-b
CG open-downward
CG rounded-corner     orien-3h E
CG non-concave        orien-3h C
CG notched-corner     orien-3h W
K  shape
CG no-gap
CG top-at
CG bottom-at
K  sort
```

```
CG wide-shape
CG one-loop
CG straight-exten     orien-c  NE
CG non-concave        orien-c  N
CG rounded-corner     orien-c  NW
CG rounded-corner     orien-c  SW
CG non-concave        orien-c  S
CG notched-corner     orien-c  SE
K  shape
CG no-gap
CG top-above
CG bottom-at
K  sort
CG wide-shape
CG no-loops
CG one-m-s-r-b
CG open-upward
CG rounded-corner     orien-3h W
CG 1-cur-exten        orien-3h C
CG rounded-corner     orien-3h E
K  shape
CG no-gap
CG top-at
CG bottom-below
K  sort
```

Figure 2 (first part). The description of this utterance which is produced by this computer program.
(m-s-r-b = most surrounded region of background)

writes them onto another file. Then the program reads the file (which it has just written) containing those graphemic signs, decides on the corresponding graphemes, and writes them[2] onto another file. In some of these files, the description of each mark (or each pair of vertically aligned marks) is preceded and followed by[3]

```
K  sort
```

and the description of the shape of each mark is followed by

```
K  shape
```

Description in terms of graphons

```
K  sort
GN ---ONE-FOCUS---
GN ---NO-LOOPS----
GN left-closed
GN no-appendage
GN middle-handed
GN not-pointed
K  shape
GN high-middle
K  sort
GN narrow-shape
GN round
K  shape              diacr    UP
GN narrow-shape
GN vertical
GN ccw-curved-end     orien-v  UP
GN crossed-end        orien-v  DOWN
K  shape              diacr    DOWN
GN high-middle
K  sort
GN ---ONE-FOCUS---
GN ---NO-LOOPS----
GN top-closed
GN notched-corner     orien-d  MAJ
GN rounded-corner     orien-d  MIN
K  shape
GN ----MIDDLE-----
K  sort
GN ---ONE-FOCUS---
GN loops
GN right-signif
GN notched-corner     orien-d  MAJ
GN straight-appen     orien-d  MIN
K  shape
GN high-middle
K  sort
GN ---ONE-FOCUS---
GN ---NO-LOOPS----
GN bottom-closed
GN midline-appen
GN cw-cur-appen
K  shape
GN middle-low
K  sort
```

Description in terms of graphemic signs

```
K  sort
GS c
GS high-middle
K  sort
GS dot                diacr    UP
GS roman-min-l        diacr    DOWN
GS high-middle
K  sort
GS minuscule-n
GS ----MIDDLE-----
K  sort
GS minuscule-d
GS high-middle
K  sort
GS roman-min-y
GS middle-low
K  sort
```

Description in terms of graphemes

```
K  word
G  letter-c
G  letter-i
G  letter-n
G  letter-d
G  letter-y
K  suprasegmental
G  initial-capital
K  word
```

Figure 2 (second part).

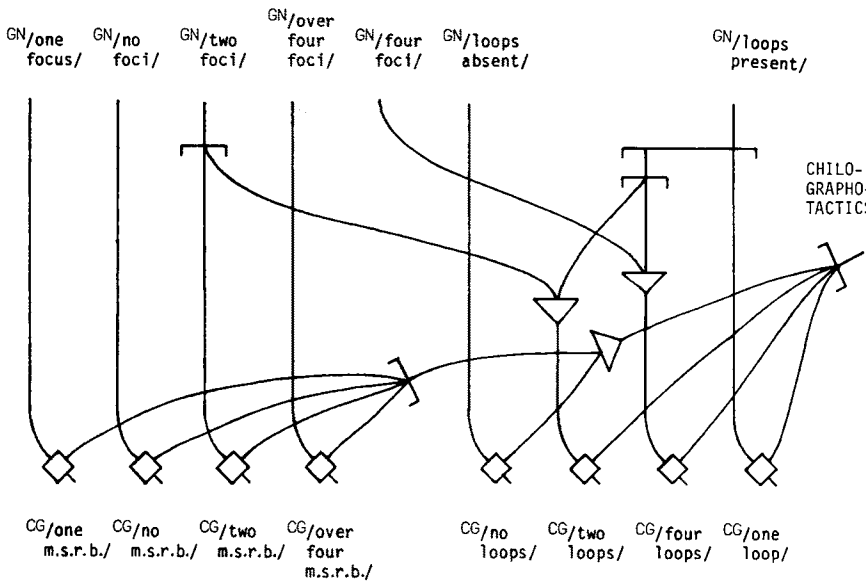


Figure 3. A realization formula that does not treat any graphons as unmarked features.

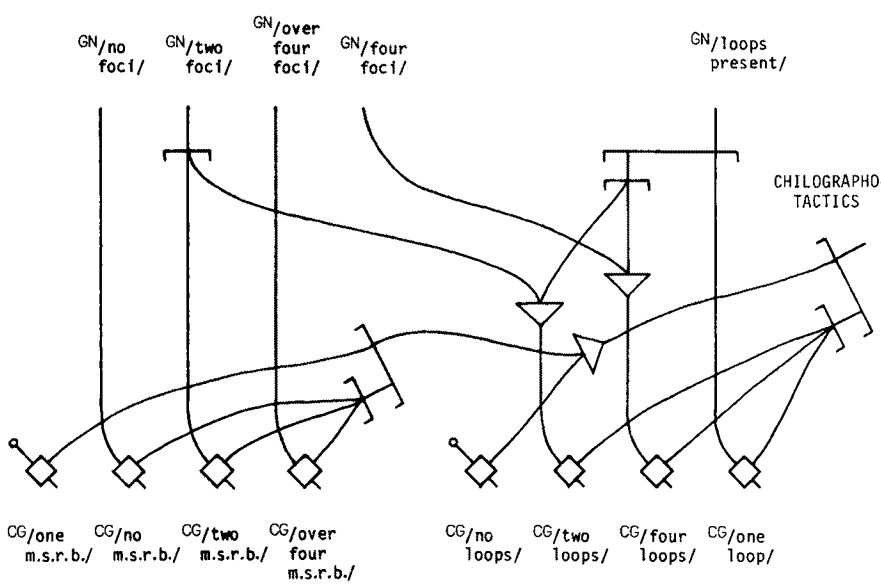


Figure 4. A realization formula that treats some graphons as unmarked features.

Level-by-level transduction, in which the entire description of an utterance on one level is written out before the transduction of the utterance to the next level is modeled, is therefore one of the ways in which this model differs from usual stratificational practice.

```
Loop_flag := 'x';

SCAN ('no-loops        ', Loop_flag, '0');
if Loop_flag = '0'
then begin
        Msrb_flag := 'x';

        SCAN ('one-m-s-r-b     ', Msrb_flag , '1');
        if Msrb_flag = '1'
        then begin
                writeln (GNdescrip, '---NO-LOOPS----');
                writeln (GNdescrip, '---ONE-FOCUS---');
                exit;
            end;

        SCAN ('two-m-s-r-b     ', Msrb_flag, '2');
        if Msrb_flag = '2'
        then begin
                writeln (GNdescrip, '---NO-LOOPS----');
                writeln (GNdescrip, 'two-foci        ');
                exit;
            end;

        SCAN ('no-m-s-r-b      ', Msrb_flag, '0');
        if Msrb_flag = '0'
        then begin
                writeln (GNdescrip, '---NO-LOOPS----');
                writeln (GNdescrip, 'no-focus        ');
                exit;
            end;

        SCAN ('over-4-m-s-r-b ', Msrb_flag, '5');
        if Msrb_flag = '5'
        then begin
                writeln (GNdescrip, '---NO-LOOPS----');
                writeln (GNdescrip, 'over-4-foci     ');
                exit;
            end;
     end;

SCAN ('one-loop        ', Loop_flag, '1');
if Loop_flag = '1'
then begin
       writeln (GNdescrip, 'loops           ');
       writeln (GNdescrip, '---ONE-FOCUS---');
       exit;
     end;

SCAN ('two-loops       ', Loop_flag, '2');
if Loop_flag = '2'
then begin
       writeln (GNdescrip, 'loops           ');
       writeln (GNdescrip, 'two-foci        ');
       exit;
     end;

SCAN ('four-loops      ', Loop_flag, '4');
if Loop_flag = '4'
then begin
       writeln (GNdescrip, 'loops           ');
       writeln (GNdescrip, 'four-foci       ');
       exit;
     end;
```

Figure 5. A part of the program for recoding chilographemes by graphons.

Figures 3 and 4 show stratificational networks which describe some of the realizational relationships that exist between graphons and chilographemes; Figure 5 shows a part of the computer program that models these relationships. The networks in Figures 3 and 4 describe the same relationships, but the one in Figure 3 uses more graphons. Of the graphons that describe the marks of written English, GN/loops absent/ and GN/one focus/ are each the most common graphons among their respective alternatives. Figure 3 includes both of these graphons; in Figure 4, these graphons have been treated as unmarked features and have been omitted.

These two networks illustrate two difficulties that will be encountered when writing computer programs that model stratificational networks. Figure 5 illustrates how this program deals with these difficulties.

One of these difficulties arises from the stratificational practice of drawing networks so that they will describe both upward and downward transduction. The program in Figure 5 models only upward transduction (from chilographemes to graphons). It reads part of a description in terms of chilographemes, and it then calls its subprogram SCAN, which runs through that part of the description and looks for the chilographeme that is specified between single quotation marks in the line of the program that calls SCAN. If that chilographeme occurs, the program writes out the corresponding part of the description in terms of graphons. This program obviously cannot be used for downward transduction; another program will be needed for transduction in that direction.

The separate handling of transduction in each direction is, therefore, another of the ways in which this model differs from usual stratificational practice.

The second difficulty that is illustrated by these networks is the need to decide whether the program should model the network in Figure 3, which contains GN/loops absent/ and GN/one focus/, or the equivalent network in Figure 4, which treats these graphons as unmarked features. This difficulty involves a trade-off between economizing the space used for writing the descriptions and economizing the time used for running the program. If the graphonic description contains the items

```
---NO-LOOPS----
---ONE-FOCUS---
no-appendage
middle-handed
not-spread
```

then the program (which is written in the Pascal language) can use the statements

```
Loop_flag := 'x';
SCAN ('---NO-LOOPS----', Loop-flag, 'O');
if Loop-flag = 'O' then
```

which will look through these items once and report that the mark has no loops (which is the most common situation for such marks). But if the graphonic description contains only the items

```
left-closed
no-appendage
middle-handed
not-spread
```

then the program will have to use the statements

```
Loop-flag := 'x';
SCAN ('one-loop          ', Loop-flag, '1');
SCAN ('two-loops         ', Loop-flag, '2');
SCAN ('four-loops        ', Loop-flag, '4');
if Loop-flag = 'x' then
```

and it will have to go through these items three times, looking for all of the less common situations. Because the program will find none of them, it will then have to infer the occurrence of the most common situation, which is that the mark has no loops. This program has been written to economize its running time, and its descriptions in terms of graphons therefore include

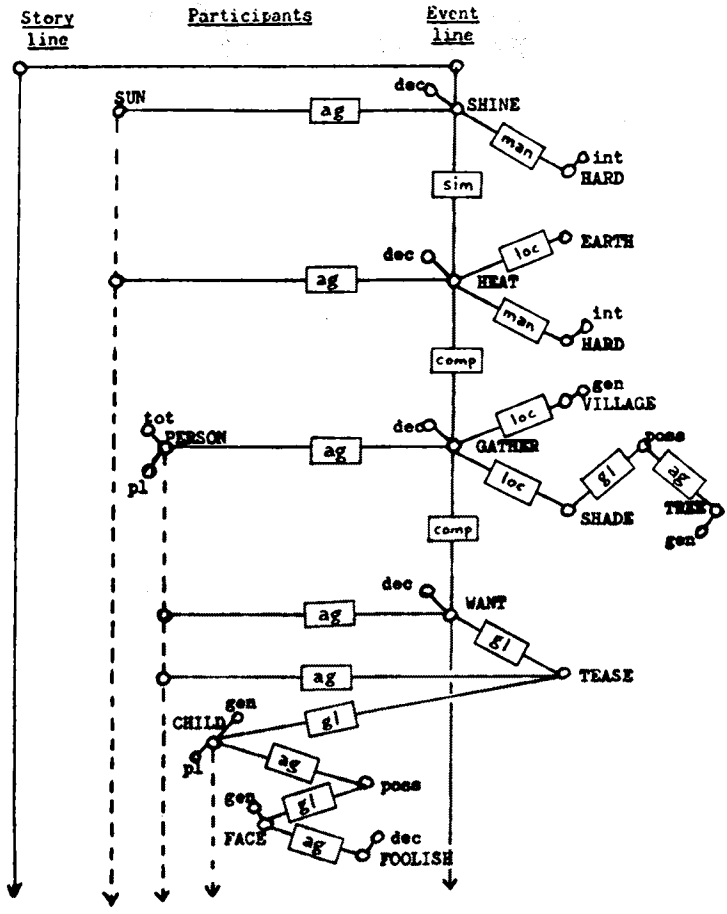
```
---NO-LOOPS---
```

although an unusual status for this item is suggested by the special way in which it is written.

The non-use of unmarked features is, therefore, another of the ways in which this model differs from usual stratificational practice.

The next difference between this computerized model and usual stratificational practice may be of greater theoretical interest. Gleason (1964) suggested that, for each stratum of language, there is a characteristic structure which any utterance has while it is being transduced through that stratum. He also suggested that the characteristic structure of a semology is a network. However, discussions of stratificational analyses sometimes became confused because the term "network" was also used for describing realizations between strata. He therefore later proposed (Gleason 1969) that the characteristic, internal structure of a semology should be called a "reticulum" rather than a "network".

Taber (1966), following Gleason's suggestion, described Sango narratives by means of semological reticula. When Taber's work



ABBREVIATIONS FOR FIGURES 6, 7, AND 8.

ag = agent of event	loc = location
comp = completed action	man = manner
dec = declarative predicate	pl = plural
gen = viewed generically	poss = possession
gl = goal of event	sim = simultaneous action
int = intensified	tot = viewed in its totality

Figure 6. A semological reticulum from Taber (1968), slightly modified.

was reprinted in 1968, he added a preface describing some changes that he would have made in those reticula if he had had enough time to do so. Figure 6 has a diagram that is taken from Taber (1968, his figure 16, page 94), except that it has been modified, as he suggested, by assigning the names of the relationals to the actual lines that show the relations.

In Figure 7, further changes have been made to the diagram in Figure 6. Some of its relationals, such as "comp" (which shows

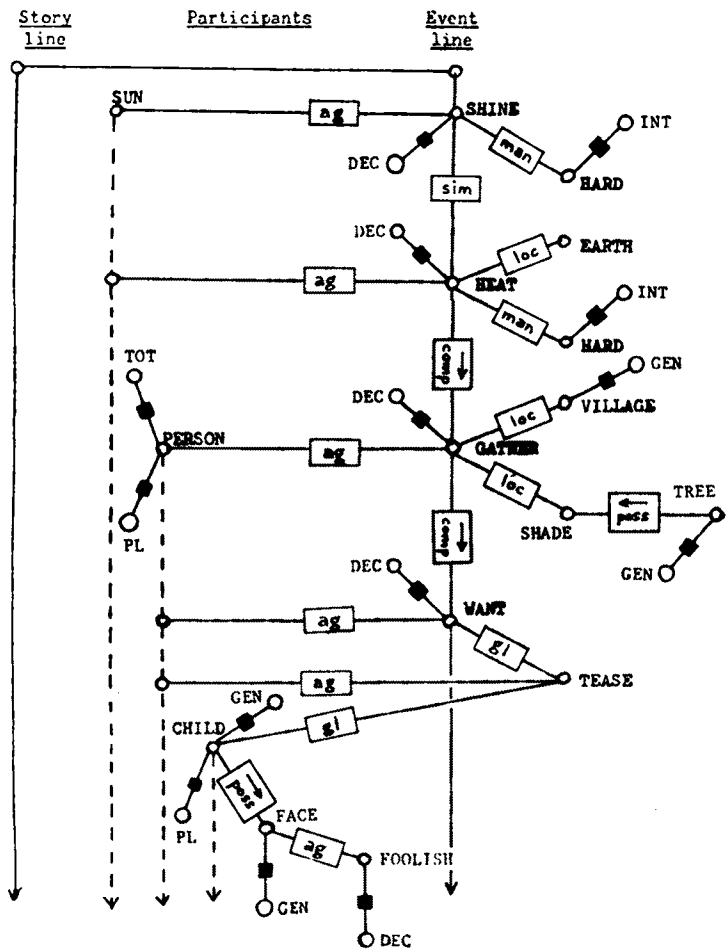
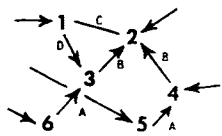
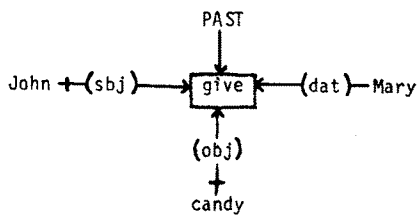


Figure 7. The same semological reticulum, further modified.

that one action is completed before another action begins), operate in certain directions. In Taber's original diagram, the temporal order for such relationals is implied by the direction of the story line and the event line.[4] In Figure 7, the direction of this relational is explicitly shown by an arrow that has been drawn inside its rectangle. This kind of notation for reticula is not original; Gleason (1964) used schematic networks with labeled arrows, such as



and notations such as



(from Blansett 1984) have been used by many authors.

A few other changes from Taber's original diagram have also been made in Figure 7. The referential "poss" and its two relationals have been replaced by a relational "poss" and an arrow that shows the direction of the relationship. And the lines in Figure 6 which simply connect two circles have had squares added to them, so that the entire reticulum consists of a pattern of alternating rectangles and circles which are connected by lines. The lines from the relationals to the referentials in a reticulum may be called valences; Gleason (1964) has used this term for similar lines, although his reticula are not organized in quite the same way as those shown here.

The conversion of this entire reticulum into a simple, alternating pattern is carried further in Figure 8, where (for a portion of Figure 7) arrows inside rectangles are replaced by labels written onto the valences that run from those rectangles. The resulting reticulum in Figure 8 consists of referentials, of relationals, and of valences that show the specific ways in which some relationals relate to referentials. Each of the referentials and relationals has a label which names its reference or relationship. The valences from a given relational have labels if they need to be distinguished from one another; otherwise, valences have no labels and may be called "blank" valences.

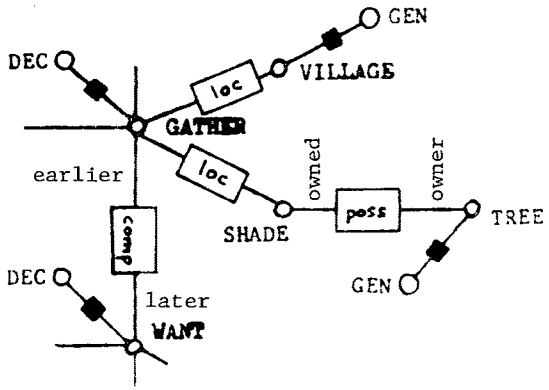


Figure 8. A part of the same semological reticulum, modified even further by labeling some valences.

This semological reticulum now looks very much like the structure that is needed for describing a graphonomy. Perhaps we will find that we need to use a reticulum for modeling the structures of all the outer parts of language so that our linguistic models will be complex enough to be compatible with the reality that exists outside language. If so, reticula would also be the proper internal, characteristic structures for phonology and for the gestures of sign languages. And because trees can be mathematically treated as degenerate reticula, the notation that we use for reticula can be used for describing the structures of utterances throughout the strata of language.

The use of reticula to describe the structures of utterances on all the levels of language is, therefore, another of the ways in which this model differs from usual stratificational practice.

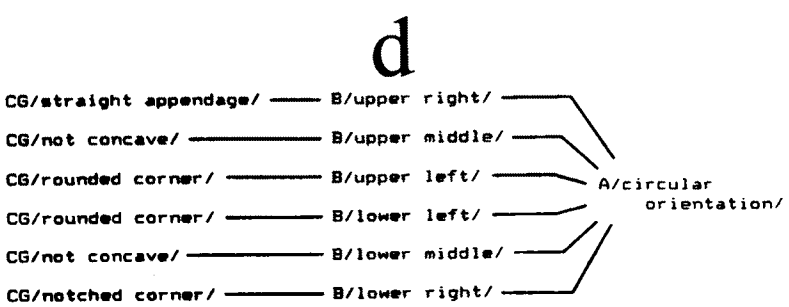


Figure 9. A reticulum that partially describes the shape of a mark.

The kind of reticulum that is illustrated in Figure 8 can be represented in a computerized model by the slash-and-superscript notation that is illustrated in Figure 9. This notation uses symbols of two new kinds: the "arachne" (with superscript "A") and the "brachion" (with superscript "B").[5] The mark in Figure 9 (which embodies the graphemic sign of shape ^{GS}/minuscule d/), is partly described by six chilographemes, each of which describes one detail of its shape; these chilographemes are referentials that would be shown by circles in networks like those in Figures 7 and 8. The arachne ^{A}/circular orientation/ in Figure 9 shows the relationships among these chilographemes; it has six brachions, one for each place along the edge of the mark where the mark can have a significantly different shape.[6]

Figure 10 points out that arachnes and brachions on one level of language can be realized by arachnes and brachions on an adjoining level. Realization formulas must be written so that they can describe such realizations.

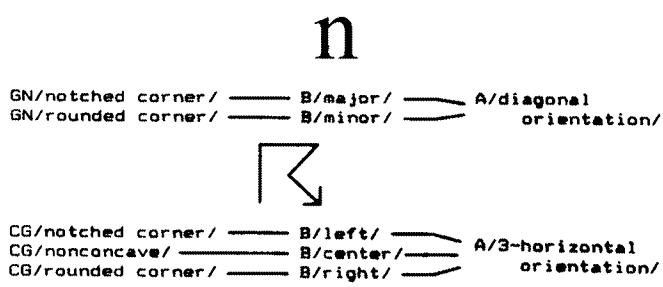


Figure 10. A realization of one arachne which includes another arachne.

When this notation is used for describing more than one mark within an utterance, some further arachnes will be required. Figure 11 shows two marks which are part of the sample utterance that is being used here. Each of these marks is described by several graphons, and ^{A}/diagonal orientation/ shows where each of these marks can have some significant differences of shape. Each mark also has an occurrence of ^{A}/simultaneous/, with "blank" brachions which do not need to be distinguished from one another and which are connected to all of the graphons that describe that mark.

Every graphon that realizes ^{GS}/minuscule n/ within this sample utterance is located to the left of every graphon that realizes ^{GS}/minuscule d/. An arachne such as

——^{B}/left/——^{A}/sequence/——^{B}/right/——

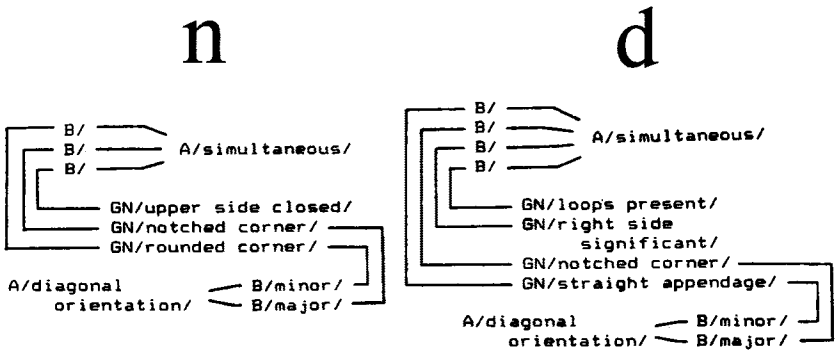


Figure 11. Descriptions of two marks.

can show this spatial sequence, but we need to decide which parts of these descriptions should be joined to this arachne and its brachions. It seems counterintuitive for every graphon that describes the n to be connected to every graphon that describes the d by a separate occurrence of ^{A}/sequence/ and its brachions. Our notation should be able to show that the entire n occurs before the entire d. It is true that each of these marks has an occurrence of ^{A}/simultaneous/ with brachions that connect to all of the graphons that describe it. But a string of arachnes and brachions such as

——^{B}/——^{A}/simultaneous/——^{B}/left/——^{A}/sequence/——

would not preserve the structure of alternating referentials and relationals that has been assumed for this reticulum.

Instead, this computerized model uses a notation that is based on an idea borrowed from Sydney M. Lamb, who has suggested that the tactics of languages have "basic cycles", which are their major parts that are used repeatedly while an utterance is being transduced or generated. In this model, the basic cycles of every tactics become readily apparent while a computer program is being written; they correspond to the major subprograms that are repeatedly called to do the actual work of rewriting the descriptions. By using Lamb's concept of a basic cycle, this model can identify the portions of an utterance that are produced by using a certain part of a tactics, and it can then state the relationships which those portions bear to one another within the utterance.

Figure 12 uses this notation to describe three sorts from this sample utterance. In this notation, each basic cycle of a tactics is represented by a "klimakter",[7] which is a label for a certain point in that tactics, and which is written between slant lines

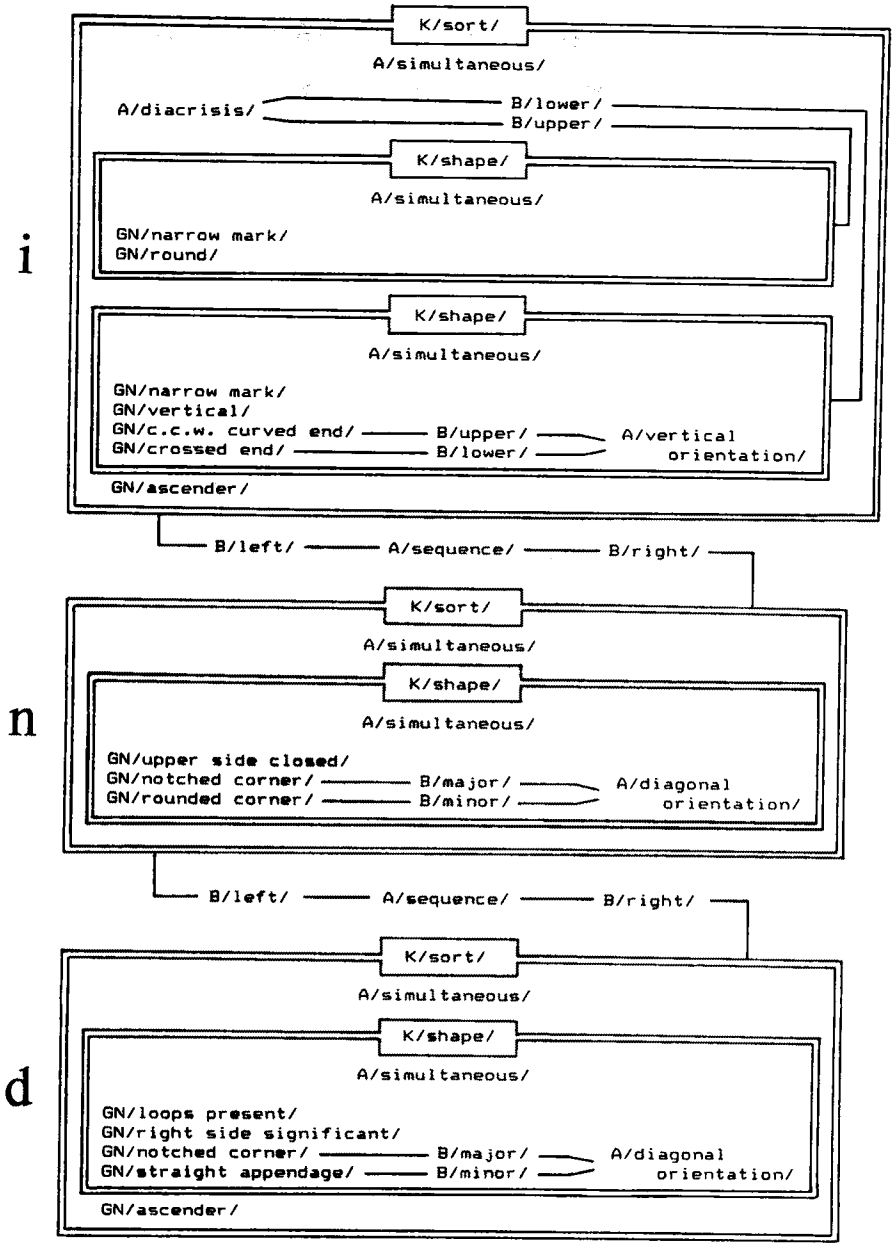


Figure 12. A description of a sequence of three sorts containing four marks.

with superscript "K". A description of a written English utterance in terms of chilographemes or graphons has two basic cycles, one of which dominates the other: the superior basic cycle is ^{K}/sort/, the inferior basic cycle is ^{K}/shape/. For descriptions on the graphemic sign level, the basic cycle is ^{K}/sort/.[8] For descriptions on the graphemic level, the basic cycle is ^{K}/word/.

In the description shown in Figure 12, each part that is produced by a single use of a basic cycle is written inside a double-lined rectangle labeled with a klimakter which names that basic cycle. Figure 12 has three such rectangles labeled ^{K}/sort/; the relative locations of these sorts in the utterance are shown by two occurrences of ^{K}/sequence/ and its brachions, which are appropriately connected to these rectangles. Inside the first rectangle labeled ^{K}/sort/, there are two double-lined rectangles, each labeled ^{K}/shape/; there is also an arachne ^{A}/diacrisis/ with its brachions ^{B}/upper/ and ^{B}/lower/ connected to these two rectangles, which show that the entire dot occurs above the entire vertical line. Inside each of the other two rectangles labeled ^{K}/sort/, there is a single double-lined rectangle labeled ^{K}/shape/; this single inner rectangle shows that its sort includes only one mark. And inside each double-lined rectangle, there is an occurrence of ^{A}/simultaneous/ without brachions; it is intended to show that all the graphons written inside the rectangle occur simultaneously with one another.

The use of basic cycles in the tactics is, therefore, the last of the ways in which this model differs from usual stratificational practice.

NOTES

1. This file of chilographemes was written by the subprograms which model the measurement schedule and measurement procedures.

2. This last file is actually written partly in terms of graphemes and partly in terms of ambiguities between graphemes. These ambiguities are disambiguated by other subprograms which model the graphotactics, but which are not described in this paper.

3. The term "sort" is used here with a meaning derived from its meaning in the printing trade. To a printer, a "sort" is one piece of printing type. Here, the term "sort" refers to one mark, together with its height, or else to two marks that occur one above the other within the same line of the utterance, together with their height.

4. Taber (1968: 75, 77) notes that "some relations are ... directional, in that the relationship they denote is not reciprocal or symmetrical. In the case of directional relationals, it becomes necessary to use some device in the notation to indicate the orientation."

5. These are Greek words that mean 'spider' and 'arm', respectively; they have initial letters that are not yet used for any labels in stratificational networks.

6. The thunderstorm symbol is used here to mean "realization"; it resembles the letter "R", and its arrow points in the direction of realization. H. A. Gleason, Jr., has used this symbol with this meaning.

7. This is a Greek word that means 'rung (of a ladder)'; it has an initial letter that is not yet used for any label in stratificational networks. It should be pointed out that only the emes of a realizational network are actually dominated by the tactics. The klimakters ^{K}/sort/ and ^{K}/shape/ actually occur in the chilographotactics, and the groups of graphons labeled with them in Figure 12 are the realizates of groups of chilographemes dominated by those klimakters.

8. ^{K}/shape/ is not needed on the graphemic sign level because the graphons which describe the shape of one mark all have a single graphemic sign as their realizate.

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MACHINE TRANSLATION: ENGLISH-KOREAN

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0. ABSTRACT

This paper discusses two experimental implementations of syntax-directed translation using two different programming languages, MICRO-PROLOG and PASCAL.

I. INTRODUCTION

We begin with an overview of Machine Translation(MT). According to Slocum (1985), a specialist in the field of MT, the development of MT can be divided into four decades, from the 50's to the present. During its first decade in the 1950's, interest and support was fueled by visions of Fully Automated High Quality Translation(FAHQT) of arbitrary texts. At that time, MT was supported especially by military and intelligence communities, who funded MT projects quite heavily. During its second decade, the 1960's, many people were disappointed since linguistic structure was such a complex multi-layered code that the translation problem was not as simple as had been expected. During its third decade, as the result of the disappointments during the 2nd decade, there was no active research except in Europe. Now we are in the 4th decade of MT, and there is a revival of interest throughout the world because there is simply no alternative means of gathering information from foreign sources quickly.

II. THE GENERAL PROCESS OF MT

We are faced with many difficulties in attempting MT. As an illustrative example, we will consider some problems of translating from English to Korean, two structurally very different languages. The most difficult obstacle occurs when we try context dependent translation in which the translation is related to the previous context. This paper is, however, confined only to intra-sentential, independent translation, or the so-called syntax-directed translation. Following the conventional steps, we can classify the translation process into three phases -- scanning, parsing and translating. This paper is aimed at scrutinizing some difficulties at each phase. The following section is devoted to examining each phase in detail

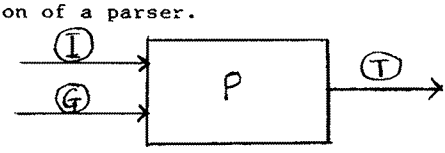
and discussing an actual implementation using the programming languages, Micro-prolog (Clark and McCabe 1984) and PASCAL.

1. The Scanning Phase

The lexical analyzer has two procedures: one is to analyze the tokens from a given input sentence and the other is to identify the lexical categories corresponding to these tokens by means of the dictionary. The former can be embedded in some symbolic programming languages such as PROLOG and LISP. In this phase, we might consider how fast we can match the tokens with words in a dictionary. When we handle a large dictionary, we must have an efficient file structure such as an indexed file.

2. The Parsing Phase

Parsing plays an essential role as a step in MT. The syntactic parser might have two functions. First, it checks as a recognizer for the syntactic categories and constructions that satisfy a given grammar. Second, it also produces a parse tree as an output. The following diagram represents a simple characterization of a parser.



In this diagram, the circles represent input data and grammar, respectively. The rectangle marked P is the parser, and T is the output of the parser, a parse tree. The rectangle P needs information in the form of rules and conditions in order to parse a given sentence. The nature of rules depends on the properties of the linguistic structures being built, as well as on interactions with other information structures in the system. There are conditions which determine the class of inputs. They may be explicitly expressed as rules as in PROLOG, or they may be embedded in procedures as in PASCAL, or a mixture of both. In an Augmented Transition Network(ATN), for example, the basic conditions are expressed in the context-free grammar which underlies the Recursive Transition Network(RTN), supplemented by ad-hoc procedural manipulations of registers.

Parsing strategies involve choices in three dimensions of strategy: Top-Down vs. Bottom-Up, Backtracking vs. Parallel, Left-to-Right vs. Right-to-Left parsing. In the case of PROLOG, Top-Down and Backtracking and Left-to-Right strategies are built into the programming language and we can not choose any other strategies. In the PASCAL implementation, a mixture of Top-Down and Bottom-up and Left-to-Right strategies are employed with an Active chart parser as described by Winograd (1983) . With this framework for parsing, let us consider some problems in parsing English sentences, e.g. sentences with conjunctions, tenses, class cleavage phenomena, and ambiguous sentences. Now we

examine these problema one by one.

(1) The conjunction problem

An English sentence like I go and he comes is just a simple sentence with two clauses and a conjunction. However, this type of sentence can cause a practical problem in actual implementation in PROLOG or PASCAL. For example, there is a response time problem in both the Micro-Prolog and PASCAL implementations; the user has to wait too long to get a response. How can we solve this difficulty? We introduce a new lexical symbol, EMPTY. Let us consider the following example:

```
A.  S' -> DS                          B.  S -> CL DS
    DS -> CL                              DS -> Empty
    DS -> CL CONJ S                       DS -> CONJ S
    CL -> NP VP                           CL -> NP VP
          .                                   .
          .                                   .
          .                                   .
```

Both grammars (A and B) accept the input sentence with a conjunction. Considered from the point of view of response time or efficiency, however, the first grammar is unacceptable. If the sentence I go and he comes is parsed, grammar A takes much more time than grammar B. In Grammar A, the same clause is checked twice if the first DS rule fails. The first DS rule goes to the CL rule and the CL rule in turn goes to NP and VP. After NP and VP rules have been checked, however, there are no more rules to be checked for the remaining part of the sentence. So, the first rule fails. Then, the second DS rule is checked, which causes the CL rule to be consulted again. That is, the first clause I go in the sentence above goes through the same process two times unnecessarily. The more conjunctions there are in a sentence, the more time it takes. In grammar B, however, the clause I go is checked only once because of the terminal symbol, EMPTY. This EMPTY symbol is like a jump arc in an ATN which is a dummy arc that does not match anything in the input sequence. This example illustrates how the form of the input grammar plays a significant role in the computer time required to parse an input sentence.

(2) Tenses

Since English tenses have morphemic status, whether bound or free, they need to appear separately in the dictionary of the morphemic level ("morphicon"). Moreover, bound morphemes (3rd person present or past tense) are attached to the verb stem with no intervening space. These bound tense morphemes are recognized within the program when it checks the verb phrase. If we listed the regular forms in a dictionary, e.g. play, played, eat, eats, etc. we cannot avoid a redundancy problem which would require unnecessary memory space for the dictionary. As far as the irregular verb forms are concerned, e.g. sing/sang, take/took, etc. we treat the irregular form as a single suppletive morpheme rather than as two morphemes. Such irregular forms appear as separate morphemes in our dictionary.

(3) Class-cleavage phenomena

In English, a word can have different functions in different positions. For example, the word saw can be a noun or a verb depending on syntactic functions. Sentences such as The rabbit with a saw nibbled on an orange (Winograd(1983:92)) or I saw him should be parsed without any problem. This class cleavage problem is dealt with in the PASCAL implementation by giving two different parts of speech in the dictionary and by taking only the syntactic rule that applies to the use of the word in the input sentence. In PROLOG, however, this phenomenon is hard to implement since PROLOG has built-in precedence ordering rather than equational ordering; The precedence ordering causes difficulty in the translation part even though it can finish parsings. This precedence ordering checks only the possibility that comes first in a translation dictionary.

(4) Ambiguous sentences

For more complicated example, let us consider the sentence such as Time flies like an arrow (Winograd(1983:117)). This sentence can be parsed in four different ways according to its different functions: Noun-Verb-PP/ ADj. Noun-Verb-Det. Noun/ Verb-NP(Noun. PP)/ Verb-Noun-PP. As a result of class cleavage consideration, our implementation can also parse such an ambiguous sentence. However, this paper considers only the first two possibilities that have subjects (Refer to the output). To parse this ambiguous sentence, we can apply the same procedure as in handling the class cleavage phenomena. Different parts of speech and different syntactic rules have been tried one by one in our English-Korean implementation. If we attempted context-dependent translation, the computer would automatically select only the one parsing that fits into the context. The ambiguous sentence is also hard to implement in PROLOG because of its characteristics of precedence ordering.

So far, we have examined both the scanning and the parsing phase and some problems that result from parsing some specific English sentences. Now we turn our attention to the next stage, the translating phase, and consider some difficulties arising from linguistic structural differences between English and Korean.

3. The translating phase.

Based on the syntax-directed translation schema, this phase transforms English syntax into Korean syntax. To achieve this transformation, each procedure or rule requires semantic actions which change the positions of the lexical items and insert markers or inflectional endings to complete a well-formed Korean sentence.

Before examining semantic actions, we will compare the syntactic structure of English with that of Korean.

	ENGLISH	KOREAN
1.	SVO	SOV
2.	Prep. + NP	NP + Postposition
3.	Head Noun + RC	RC + Head Noun
4.	No markers	SM (-C i/ -V ka)
		TM[2](-C eun/ -V neun)
		OM (-C eul/ -v leul)
5.		Complex verb endings
6.		Predicative vs. Attributive

(1) Word order

The difficulties caused by different word order (1-3) can be easily solved by restructuring the Korean symbols corresponding to English terminal symbols according to Korean syntax when realizing the Korean sentence. This restructuring is achieved by swapping and appending the lists generated from sub-rules based on English and Korean syntax. For example, after the parse tree for a sentence such as I like you is made, the translated Korean terminal symbols are rearranged in Korean word order (SOV) to give *I you like.

(2) Markers and verb inflections

How, then, can we insert role markers and verb endings? Linguistically, these have different status. According to Hockett(1958) a marker is a separate word while the inflectional endings are not. Therefore, when we attach markers to nouns, whether topic or object markers, or inflectional endings to verbs, we need to employ different techniques; The markers are inserted as separate words and the verb endings are attached to the verb stem with no intervening blank. Consider the following verb.

Mul - li - si - ess - eupnita
V. Stem PASS DEF PAST DEC

In Korean, many suffixes representing passive, deferentiality, tense and sentential state are attached to the verb stem, sequentially. As we can see in the table above, the shapes of these verb endings and markers are conditioned by the last element of the immediately preceding verb or noun, respectively (phonological conditioning). For example, the topic marker -eun occurs if the last element of the topic is a consonant; otherwise, one would add -neun. The past tense suffix -ess is attached if the last element of the verb stem is a consonant; otherwise, one would attach -ss. Our solution to this question has been to design the program to insert markers and verb endings. After the word order is changed according to Korean syntax, the endings and markers are inserted when completing the Korean sentence.

(3) Copular Verb Construction

The last problem (6 in the table above) concerns Korean copular verb constructions. The English structure of copular verb be + adj does not correspond to the Korean copular verb constructions. In English, an adjective always acts the same way whether it precedes the noun or follows the verb while in Korean the verb 'to be', when it precedes a predicative adjective, combines with that adjective. Let us examine the following sentences.

a.	I am sad.	Na neun seulpeuta.
b.	I am a sad girl.	Na neun seulpeun sonye ita.
c.	I like you.	Na neun ne leul choahanta.

In sentence (a) seulpeuta is a predicative adjective which acts like the English copular verb be plus an adjective. On the other hand, in sentence (b), seulpeun is an attributive adjective which corresponds only to English sad. To treat this problem, we make a separate syntactic rule that checks only the copular verb construction and attaches the -ita or -n ending within the program depending on whether the adjective is used predicatively or attributively. The establishment of this separate rule can be justified by another fact. Sentence (b) does not need an object marker -leul even though it has an NP-V-NP structure as does sentence (c). Hence, the separate copular verb rule can be helpful in checking constructions such as that in (b).

III.CONCLUSION

Up to this point, we have examined three general phases of Machine Translation from English to Korean --scanning, parsing, and translating. This paper is a preliminary attempt using only a context-free parser and deterministic algorithms. If MT wishes to be a true part of the computational linguistic paradigm, as Kettunen(1986) suggests, it should pay more attention to its linguistic premises. A programming language is just a means to represent our algorithms. As each programming language has its own pros and cons, it is very hard to tell which one is better than the other; since the PROLOG programming language is very descriptive, it allows us to make a shorter program compared to imperative programming languages, e.g. PASCAL. However, as PROLOG has built-in strategies such as Top-Down or Backtracking, we can not construct a flexible programming. On the other hand in PASCAL implementation we can institute a clearly step-wise phase and easily modify each phase without producing any detrimental effect on the other phase. Regardless of what types of programming language is used, as recommended by Lamb(1964), linguistic information should be separated from programming itself.

Further research will attempt to develop a grammar that can solve the problems of word sense ambiguity and that handles more complicated English syntax.

OUTPUT

```
ENGLISH-- I am sad.

    Do you want to see the parse tree (y/n)?

KOREAN-- NA NEUN SULPUTA.

    Do you want to continue (y/n)?


ENGLISH-- I like sad.

ERROR: Syntax Error

    Do you want to continue (y/n)?


ENGLISH-- I am a sad girl.

    Do you want to see the parse tree (y/n)?

    **-- PARSING SEQUENCE --**

            S / CL DS
            CL / NP VP
            NP / NP2
            NP2 / NOUN
            VP / COPVERB NP
            NP / DET NP2
            NP2 / ADJ NP2
            NP2 / NOUN
            DS / EMPTY

KOREAN-- NA NEUN SULPUN SONYE ITA.

    Do you want to continue (y/n)?


ENGLISH-- I like a boy.

    Do you want to see the parse tree (y/n)?

KOREAN-- NA NEUN SONYEN EUL COAHANTA.

    Do you want to continue (y/n)?
```

ENGLISH-- He makes the girl who likes an apple sad.

Do you want to see the parse tree (y/n)?

KOREAN-- KU NEUN SAKWA LEUL COAHANEUN SONYE LEUL
SULPUKE MANDUNTA.

Do you want to continue (y/n)?

ENGLISH-- I give her a doll.

Do you want to see the parse tree (y/n)?

-- PARSING SEQUENCE --

```
S / CL DS
CL / NP VP
NP / NP2
NP2 / NOUN
VP / BIVERB NP NP
NP / NP2
NP2 / NOUN
NP / DET NP2
NP2 / NOUN
DS / EMPTY
```

KOREAN-- NA NEUN KUNYE EKE INHYENG EUL CUNTA.

Do you want to continue (y/n)?

ENGLISH-- I admire you.

ERROR-- The word, ADMIRE, is not in the dictionary.

Do you want to continue (y/n)?

ENGLISH-- I go and her comes but she sleeps.

Do you want to see the parse tree (y/n)?

KOREAN-- NA NEUN KANTA KULIKO KUNYE NEUN ONTA KULENA
KUNYE NEUN CAMCANTA.

Do you want to continue (y/n)?

ENGLISH-- Time flies like an arrow.

Do you want to see the parse tree (y/n)?

-- PARSING SEQUENCE --

S / CL DS
CL / NP VP
NP / NP2
NP2 / NOUN
VP / VP PP
VP / VERB
PP / PREP NP
NP / DET NP2
NP2 / NOUN
DS / EMPTY

KOREAN-- SIKAN EUN WHASAL CEULEUM HLUNTA.

** We have another parse tree.

Do you want to see that (y/n)?

-- PARSING SEQUENCE --

S / CL DS
CL / NP VP
NP / NP2
NP2 / ADJ NP2
NP2 / NOUN
VP / VERB NP
NP / DET NP2
NP2 / NOUN
DS / EMPTY

KOREAN-- CHO PALI NEUN WHASAL EUL COAHANTA.

FOOTNOTES

1. S:Sentence; DS:Declarative Sentence; CL:Clause; CONJ:Conjunction; PASS:Passive; DEF:Deferentiality; DEF:Declarative Sentence Ending;

2. The subject position is usually reserved for topic in a language and we employ topic markers instead of subject markers.

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DYNAMIC LEXICAL MEMORY[1]

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Linguistic knowledge is a part of memory and certainly shares some basic properties with the rest of memory. Two general features of memory are of interest here. First, memory needs to be organized in a way that makes knowledge easily accessible when it is needed. Second, memory is dynamic; it is constantly being updated to account for novel data and to streamline processing. The **Lexical Memory** approach to the representation of linguistic knowledge, outlined in this paper, is based on these two points. Linguistic memory is a hierarchy of generalizations of individual utterances, each generalization consisting of pragmatic/semantic and morpho-syntactic components. The model is partially implemented in a computer program called CHIE, which generates sentences in Japanese and English, given conceptual input.

1. Theoretical Framework

The Lexical Memory (LM) model draws from or shares features with a variety of approaches in linguistics, psycholinguistics, and artificial intelligence. These include Langacker's cognitive grammar (1986), Hudson's word grammar (1984), stratificational grammar (e.g., Lamb, 1966; Makkai, 1972), tagmemics (e.g., Jones, 1980), Fillmore's work on idiomaticity (1979), Lakoff & Johnson's approach to metaphor (1980), Peters' research on the units of language acquisition (1983), Pawley & Syder's work on idiomaticity and language production (1983), Rosch's prototype theory (1978), the phrasal lexicon approach to natural language processing (e.g., Jacobs, 1985; Zernik & Dyer, 1986), the theory of memory organization of Schank and his colleagues (e.g., Schank, 1982), and various hierarchical models of knowledge representation from AI, in particular, Fahlman's NETL (1979).

LM is characterized by the following points:

1. Both specific and general knowledge have important roles in memory. While general knowledge allows the system to deal with unexpected sets of circumstances, specific knowledge provides "compiled" pieces of memory so that the system can act quickly in recurring sets of circumstances. Knowledge of varying degrees of generality is integrated in **generalization hierarchies**.
2. Learning takes place primarily when the system is faced with data that cannot be handled in terms of existing generalizations. In such cases generalizations incorporating the new data and one or more existing concepts are added to memory.
3. All domain-specific knowledge and all linguistic knowledge is stored in the hierarchical memory network, and a small set of general

[1]The research reported on here was supported in part by a grant from the ITA Foundation.

procedures operates on this knowledge during processing. Processing can be viewed as the **classification** of an input from the outside world or from the system itself in terms of one or more generalizations in memory and the **inheritance** of useful information from these generalizations to the representation of the input.

4. Acquiring language consists in making generalizations about how particular types of morpho-syntactic patterns achieve particular types of speaker goals. The basic units of linguistic knowledge, then, are **generalized utterances** (GUs), which, like the rest of memory, are arranged hierarchically.
5. Idiomaticity and metaphor are pervasive phenomena in language. The syntactic and semantic relationships between figurative and literal uses of language are represented explicitly in the hierarchies of GUs and concepts. Once established, metaphorical relationships can aid a listener in interpreting novel expressions and a speaker in generating novel expressions.

2. Memory

The knowledge representation scheme used in the Lexical Memory model is an example of a semantic network, a structure in which nodes represent concepts and links primitive relations between concepts. The two fundamental sorts of relationships between concepts are **specialization/generalization** and **head/role**. Concept A is a generalization of concept B if all of the properties of A are also properties of B but the reverse is not the case. For example, the concept HUMAN is a generalization of the concept WOMAN; in the network, the WOMAN node is joined to the HUMAN node by a generalization link. The generalization relation imposes hierarchies on the set of concepts. At the bottom of this hierarchy are **instances**, that is, representations of individual objects, events, facts, and relations; all other nodes in the network are **type** concepts, representing prototypes. A concept may be linked to more than one generalization above it in the hierarchy. For example, WOMAN generalizes to both HUMAN and FEMALE-ANIMAL. On the left side of Figure 1 is a graphical representation of the portion of the network described thus far. Rectangles represent nodes and arrows generalization links, with the arrow head at the generalization end.

Each node in the generalization hierarchies can be thought of as the head of a **schema**, a structure representing knowledge that is directly associated with the head concept. This structure consists of the head node and **role** nodes representing concepts which are seen as "belonging" to the head concept. Roles may represent parts, attributes, associates, or arguments of a fact or event. Roles are either types or instances within their head schemas. For example, the RELATIVE role in the ANIMAL schema is a type—it represents the prototypical relative of the animal—while the MOTHER role is an instance of RELATIVE. Several examples of roles are shown in Figure 1. Role names appear in lower-case within their heads. Because roles are themselves concepts and

nodes in the network, they may have their own roles. Thus schemas have their own hierarchical structure. In the figures indentation within schemas indicates levels in role hierarchies.

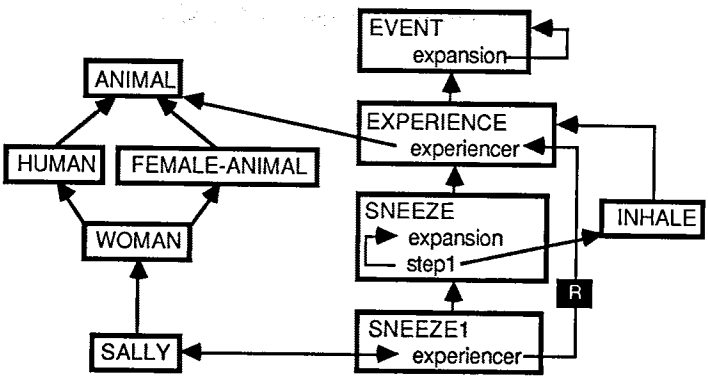

Figure 1: Portion of Conceptual Memory

Each role is normally **restricted** to either a type of an instance. For example, the EXPERIENCER role (in the EXPERIENCE schema) generalizes to the type ANIMAL, and in the schema representing the event *Sally sneezed*, the EXPERIENCER role is equivalent to the instance SALLY. An equivalence relationship may also link two roles within the same schema. For example, the ACTOR and SEMANTIC-OBJECT roles in the SUICIDE schema are equivalent. It is the roles of a concept and their restrictions which are implicitly "inherited" by all concepts lower in the generalization hierarchy. Thus since SNEEZE is a specialization of EXPERIENCE, SNEEZE has an EXPERIENCER role, and its EXPERIENCER is an ANIMAL. Unless further restrictions are to be specified for an inherited role, however, there is no need to actually create it within a schema. Clearly roles have their own generalization hierarchy. Thus, for example, the EXPERIENCER role of an instance of SNEEZE generalizes to the EXPERIENCER role of the EXPERIENCE generalization. The links joining these roles are referred to as **role generalization** links. The right side of Figure 1 illustrates the representation of the event *Sally sneezed*. Equivalence links are indicated by two-headed arrows and role generalization links, only one of which is shown, by arrows with "R" labels.

3. Lexical Memory

In the Lexical Memory approach, knowledge about language consists of generalizations about **utterances**, meaningful uses of language. Each **generalized utterance** (GU) is a specialization of the concept UTTER, itself a specialization of ACT. Like other ACTs, each GU has roles for the actor, i.e., the SPEAKER (or writer); the IMMEDIATE-GOAL

behind the act; and the TIME-OF-OCCURRENCE. GUs are realized as phrases rather than individual words; each GU has a set of EXPANSION roles which are either instances of morphemes or of other GUs. One particular EXPANSION is common to all GUs, the SYNTACTIC-HEAD of the utterance. In addition, all GUs have roles for the LISTENER (or reader), the current TOPIC of discussion, and the CONTENT, the concept which the utterance is designed to activate in the listener.

In sum, each GU has a semantic component (the CONTENT), a pragmatic component (the SPEAKER, LISTENER, IMMEDIATE-GOAL, TOPIC, and TIME-OF-OCCURRENCE),[2] and a morpho-syntactic component (the EXPANSIONs) (Figure 2). As with other schemas, however, reference need only be made in a given GU to those roles about which something is being said. The right side of Figure 2 gives an example of a simple GU corresponding to the lexical entry for the verb *sneeze*. Names of GUs begin with "U". Words or morphemes realizable as phonological sequences have their pronunciations indicated in italics in the figures.[3]

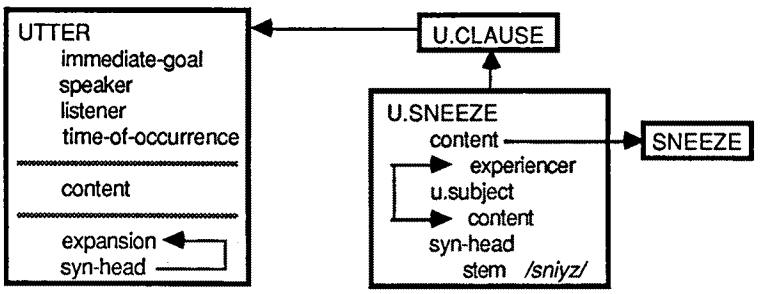

Figure 2: Generalized Utterances

In this paper, we will not be much concerned with syntactic details. In general, LM makes use of more dependency relations and less embedding than is the case in most theories. There is, for example, no separate VP constituent, the subject being treated as a special kind of complement. Ordering constraints, represented as **sequence links**, are maintained separately from constituency relations.

One feature that distinguishes this approach from most other theories of the lexicon is the use of the phrase as the basic lexical unit. Thus for the GU U.BREAK it is not the word *break* which refers to the concept of breaking but rather a clause with a form of *break* as head. The advantage of this arrangement is that it allows lexical entries such as U.BREAK to be integrated into the rest of linguistic memory and for

[2]In fact, the semantic and pragmatic components are somewhat more complex than this. In particular, there is the possibility of higher-level speaker goals for various speech act categories (Gasser & Dyer, 1986).

[3]LM currently has no phonology, and pronounceable morphemes are treated as directly realizable ACTs.

syntactic relations to map onto conceptual relations. Thus on the one hand, this GU is just a generalization of more specific GUs such as U.BREAK-BONE. In other words, a clause containing a phrase such as *break an arm* is a specialization of the category of clauses with *break* as head in the same way that the concept of breaking a bone is a specialization of the concept of breaking,. On the other hand, U.BREAK itself is a specialization of the GU U.TRANSITIVE-CLAUSE just as the concept of breaking is a specialization of the concept of TRANSITIVE-EVENT. In this way phrasal lexical items, single-word lexical items, and grammatical patterns are viewed as points along a continuum from specific to general.

Utterance instances usually instantiate more than one GU. Figure 3 shows how the utterance realized as *Sally sneezed* fits into the hierarchy of GUs. This utterance, designated "U1" in the figure, instantiates three distinct GUs, each providing some of the semantic and morpho-syntactic elements of the utterance.

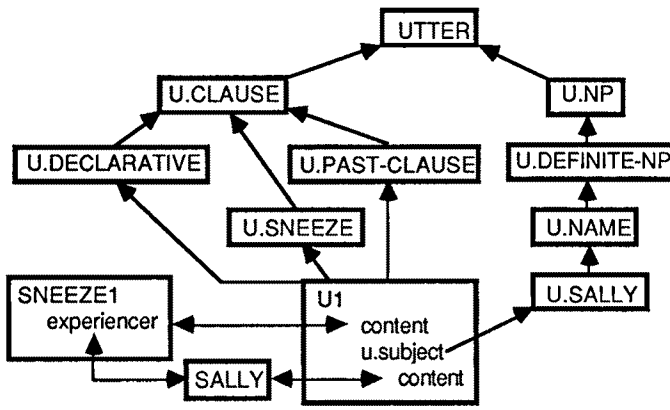

Figure 3: LM Hierarchy and an Individual Utterance (*Sally sneezed*)

The fact that each GU is a declarative, i.e., non-directional, association means that it can be used for both production and comprehension. Linguistic processing begins with an input in the form of an utterance instance with some roles specified and others missing. In the case of production, a goal role (either the IMMEDIATE-GOAL or a speech-act-related goal) and/or the CONTENT role is provided, and in the case of comprehension the EXPANSION roles are provided. In both cases processing begins with the classification of the input utterance in terms of one or more GUs in lexical memory on the basic of the available input roles. When a matching GU is found, its role information can be inherited to the input utterance. For example, during production of an utterance whose content is an instance of the concept SNEEZE, the GU U.SNEEZE is matched. Then the SYNTACTIC-HEAD role of U.SNEEZE can be inherited, providing the speaker with the verb root *sneeze*. During comprehension

of an utterance containing a form of the word *sneeze*, U.SNEEZE is also matched, and the information that the utterance refers to an instance of SNEEZE is inherited. During both processes there is also the possibility that a matching GU will not be found because of a deficiency in lexical memory. It is in such cases that an opportunity for learning presents itself.

4. Generalization

Peters (1983) has argued that the units of early language acquisition are phrases rather than words. A linguistic generalization may involve the segmentation of a unitary pattern and the corresponding association of semantic components to each new portion of the pattern, the creation of a syntactic class for a particular slot in two known patterns, or the creation of a new unit combining known pieces. On this view, syntactic patterns arise out of lexical patterns. The lexicon/grammar I have described is organized in a way that makes this possible.

In LM new generalizations are not made without good reason. A gap in lexical memory that results in a breakdown during comprehension or production provides the impetus for the formation of a new generalization. In this paper we consider only the learning that takes place as a result of comprehension failures. For some thoughts on learning arising out of problems with production, see Gasser (1985). There are two ways in which a listener may experience difficulty: the input utterance contains either a novel form or a novel combination of known forms. Here we will not be concerned with the details of what goes on during the intermingled processes of comprehension and learning; a computational model of this process for phrasal verb idioms has been worked out by Zernik & Dyer (1986).

In what follows I look at examples of the creation of new GUs for both types of comprehension difficulties. The approach taken here is to seek a plausible scenario for the acquisition process rather than to establish with any degree of certainty what actually takes place. Note also that the analyses described here have not yet been implemented in the program, and there may remain details which present computational problems.

First consider an example from Japanese, the use of the auxiliary *iru* along with the *–te* form of the main verb to express a state resulting from an event. Thus we have pairs of the following type: *tat–ta* '(someone) stood up' / *tat–te iru* '(someone) is standing', *kimono o ki–ta* '(someone) put on a kimono' / *kimono o ki–te iru* '(someone) is wearing a kimono'. Let us assume that our learner has separate GUs for the past and *te–iru* forms of the verbs *tatu* 'stand' and *kiru* 'put on (clothes above the waist)'. At this point the learner has not recognized what the two generalizations for each verb have in common. In addition, we assume that the learner is familiar with the *te–iru* form, but not the past, of the verb *neru* 'lie down, go to sleep'. Some of the relevant GUs are shown in fuzzy outline in Figure 4.

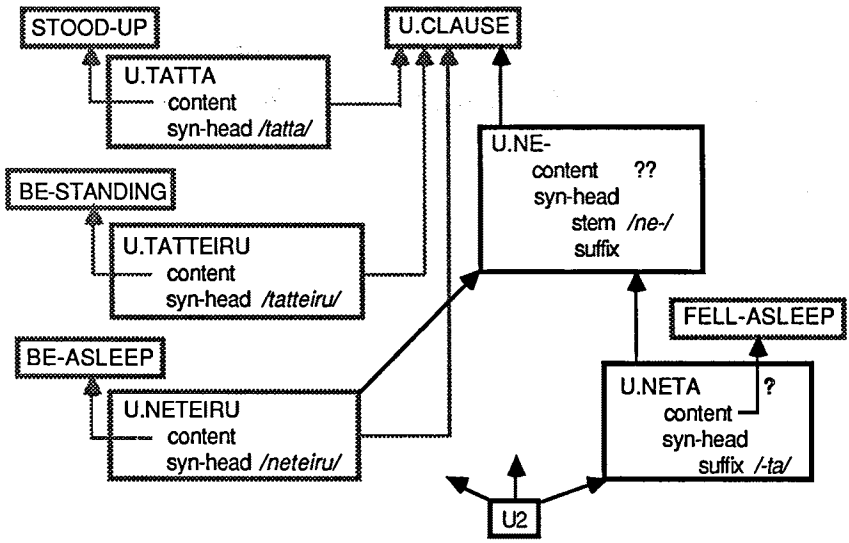

Figure 4: Segmentation of a Verb

Say the learner now encounters the following input sentence: *hayaku ne–ta?* 'did (you) fall asleep quickly?' Assuming s/he is familiar with the expression *hayaku*, the input will match the GU for that expression, but since there is no GU for the past form of *neru*, no matching GU is found which specifies the nature of the event referred to. Two kinds of information now work jointly to help the listener interpret the sentence. First, the context may lead him/her to expect the question to make reference to sleep. Second, the input partially matches the GU U.NETEIRU. This leads the learner to posit a generalization emcompassing both U.NETEIRU and the input sentence. Figure 4 shows the picture at this point; the newly acquired nodes and links are distinguished by the dark lines. The new GU, U.NE–, segments the SYNTACTIC-HEAD of the pattern into STEM and SUFFIX roles. The STEM is specified for U.NE– and the SUFFIX for U.NETA and U.NETEIRU. Note, however, that U.NETEIRU is not updated at this point; its SYNTACTIC-HEAD is still the unsegmented *neteiru*.

Neither the semantics of U.NETA nor that of U.NE– may yet have been worked out, however. In order to accomplish this, the learner needs to note what the two GUs U.NETA and U.NETEIRU share with other GU pairs such as U.TATTA / U.TATTEIRU and U.KITA / U.KITEIRU. First, there are the formal similarities: if the patterns for these other GUs are segmented in the same way, some have the suffix *–ta* and others the suffix *–teiru* in common. Second, the GUs with suffix *–ta* all refer to PAST-EVENTs, while those with suffix *–teiru* all refer to PRESENT-STATEs. GUs are now created for the two new categories.

However, there is still the problem of the nature of the semantic relationship between the *–ta* and *–teiru* forms for each verb. During production of a clause with *–teiru*, a speaker begins with a state and, in order to proceed, must access the INITIATING-EVENT of the state, that is, the event which originally brought about the state. This piece of knowledge is encoded in the form of a **role-update link** in U.–TEIRU. The significance of this link is that during processing the CONTENT is at one point a STATE and at another the INITIATING-EVENT of the STATE. The ordering of these two points depends on whether the process in question is production or comprehension. During production the CONTENT is initially a STATE, and it is then set to the INITIATING-EVENT when U.–TEIRU is accessed. During comprehension the reverse happens. The final form of U.–TEIRU is shown in Figure 5. The role-update link is labeled "U". The "[2]" label on the generalization link to U.EVENT indicates that this link applies only when the CONTENT is equivalent to the EVENT.

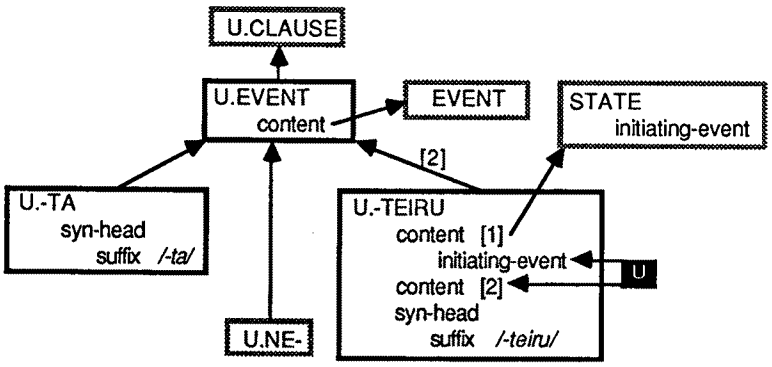

Figure 5: GUs for *-ta* and *-teiru*

Note how the availability of the U.–TEIRU generalization permits two possibilities for processing. For production, given a state, the speaker may directly access the specific GU corresponding to the particular type of state, for example, U.NETEIRU. Alternatively, the speaker may select U.–TEIRU on the basis of the content being a generic state, then set the content to the initiating-event, and finally access the GU for the particular event-type, for example, U.NE–. The former alternative has the advantage of providing the pattern components *nete iru* in pre-compiled form; for the latter this form is generated from the components *ne–* and *–teiru.* Though costly in terms of memory space allocation, the redundancy provides processing advantages. We would not expect it for every verb, however; if the *–teiru* form for a given verb has never been encounted, the speaker must resort to using U.–TEIRU and the GU for the event type in combination.

Now consider how the GU for the expression *break a promise* might be acquired. We assume that a relatively general sense of transitive *break* has been learned through a series of generalizations

including GUs whose CONTENT roles are instances of breaking bones, breaking glass, and breaking machines. The content of U.BREAK is an act which has the consequence of disabling the process constituting the function of the semantic object of the act (Figure 6).

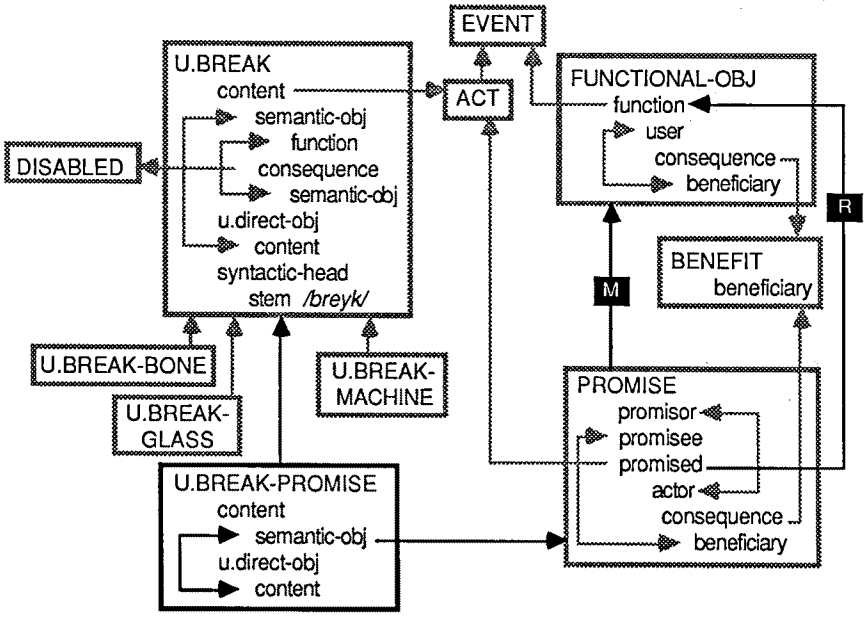

Figure 6: The Promise-as-Functional-Object Metaphor

Now say the learner is presented with the sentence *don't break your promise.* Assume s/he knows what a promise is and has a GU for the noun *promise.* The word *break* is recognized, and the input utterance is assigned to U.BREAK. However, the CONTENT of U.BREAK is specified as a FUNCTIONAL-OBJECT, a subtype of PHYSICAL-OBJECT, and a promise is obviously not a physical object. This leads the learner to create a special GU for the expression *break a promise.* In order to arrive at a meaning for the phrase, the learner again makes use of both context and the available linguistic knowledge. I consider only the latter; see Zernik & Dyer (1986) for a discussion of the use of context in ascertaining the meaning of a novel phrase. First, the learner assumes that, at least for the purposes of this expression, a promise is to be viewed as a functional-object. A **metaphor link** is created joining PROMISE to FUNCTIONAL-OBJECT. A metaphor link behaves in much the same way as a generalization link; the difference is that not all roles in the generalization will map down to the specialization. One role of PROMISE that is analogous to a role in FUNCTIONAL-OBJECT is PROMISED, corresponding to the FUNCTION role of FUNCTIONAL-OBJECT. In both cases there is an event (possibly recurring) which has the consequence of

benefiting someone. Therefore, these two roles are joined with a role-generalization link (Figure 6).

What remains is to determine the nature of the act which disables the function of a promise, if this is not already obvious from the context of the utterance. From the input sentence and context it is clear that the ACTOR of the breaking is the same as the PROMISOR, and from the PROMISE schema, it can be seen that this person is also the ACTOR of the PROMISED act, that is, the function to be disabled. For a person to disable an act for which he himself is the actor, it suffices for him simply to fail to perform the act. This then is what we are left with for the meaning of *break a promise*: the actor fails to carry out the promised act.

Later U.BREAK-PROMISE will be generalized to include other types of agreements and the nouns referring to them: *appointment*, *engagement*, *commitment*, *contract*, etc. Though the promise-as-functional-object metaphor has served its purpose and will not be needed for later comprehension or production of the expression *break a promise,* it is there to aid in the comprehension of other expressions based on this or related metaphors. We can see an agreement-as-physical-object metaphor, for example, in expressions such as *firm commitment*, and a promise-as-commodity metaphor in expressions such as *take back a promise.*

5. Conclusions

The approach outlined in this paper has a good deal in common with other network approaches to the lexicon, in particular, Langacker's cognitive grammar (1986), Jacobs' KING system (1985), and stratificational grammar (Makkai, 1972). All make extensive use of generalization hierarchies, afford a crucial role to the form-function association, and treat idiomaticity as a key feature of language. LM is distinguished from these models in primarily three ways:

1. Comprehension, production, and acquisition are explicitly addressed.
2. Basic lexical units consist of phrases rather than individual words. This permits the integration of syntax, single-word lexical items, and phrasal lexical items.
3. As generalizations of individual utterances in context, GUs permit reference to pragmatic as well as semantic and morpho-syntactic features.

In this paper we have seen how a consideration of the ways in which linguistic forms are acquired and processed leads to a particular view of the structure of linguistic memory. The hierarchical, phrase-based nature of LM, as well as specific constructs such as role-update and metaphor links, are a direct reflection of this approach. In its present form the model is still limited in the range of syntactic and semantic structures that are covered. Work is currently proceeding on the high-level GUs responsible for definite references, relative clauses, and topic-comment constructions. In addition, we are investigating the nature of

linguistic memory in bilinguals and the manner in which novel phrases may be created during production.

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A Computational Model for Representing WORD Knowledge*

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0. Introduction

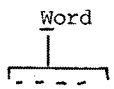
Following the approach outlined in Hudson's Word Grammar (1984), entities in the lexicon include words and their parts, their models, their companions, their referents and their contexts of use. In addition, we propose to represent each entry by means of a lexical frame whose slots correspond to Hudson's five relations.

1. Word Grammar

Hudson sees language as consisting entirely of DECLARATIVE knowledge, expressed as propositions. These propositions declare the nature of the relationships or connections between entities represented as nodes in the network. Hudson identifies five types of propositions; his description of each follows and is accompanied by the corresponding diagram notation for each (1984:8-9):

(1) Composition

This relates the word to its parts.



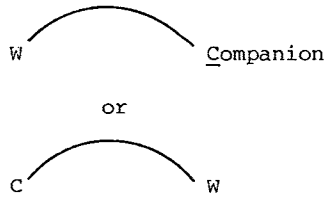
(2) Model

This relates the word to the more general entity of which it is an instance.

*This paper was one of two which received the Presidents'Commendation.

(3) Companion

These propositions relate the word to the other words with which it occurs.

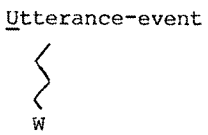


(4) Referent

All the connections between a word and the semantic structure are established via the word's 'referent.'

(5) Utterance-event

A word is linked to its speakers, addressees,times and places of utterance via the event of uttering the word.



Every ENTRY is thus described in terms of its parts (composition), model(s), companion(s), referent(s), as well as its occasion(s) of use. Following the notational tradition of tagmemics, Hudson expresses the five proposition types as 'slots' and their corresponding values as 'fillers'. I believe a parallel may be drawn with Marvin Minsky's notion of frame as being comprised of slots, or terminals, which are in turn "filled with specific instances or data" (Minsky, 1982:340). Minsky further describes a frame "as a network of nodes and relations."

Winston and Horn (1981) propose to represent a frame as an association list nested to a depth of four levels. If we picture an association list as a list of pairs, then the four levels would appear as follows:

[FRAME.NAME [SLOT [FACET [VALUE]]]]

A frame can have any number of slots; slots can have number of facets; facets can have any number of values. When it comes to representing word knowledge, Hudson's 'prime dimensions' or relations become the slots of the frame for each lexical entry. To illustrate, Hudson's example entry (1984:9,10) for the verb 'pop' - as in the sentence "The balloon popped" - which he presents in formulae as well as in graphic notation can be represented just as easily in frame format as shown in Figure 1 below

```
[pop [composition  [p1   [model    [/p/]]]
                   [p2   [model    [/o/]]]
                   [p3   [model    [/p/]]]]
     [model        [verb [companion [<[c]]]]]
     [referent     [pop* [model     [event]]
                         [change    [c*]]]]]
```

Figure 1

2. Lexical frames

Lexical frames are described by Dieter Metzing (1981) "as a device to represent lexical items in terms of speaker-dependent constructs ('lexical representations')"(325). Compared with other more formal semantic theories where lexical items are analyzed in terms of intentions, in terms of what is true in possible worlds, the frame approach is speaker-oriented with a common sense reasoning component (324).

Frame theory offers more than simply a convenient method for listing facts. Putting frame theory in perspective, Metzing writes (329-330)

> It has been claimed: that frames are, to a large extent, only a special syntax for expressions of predicate logic (Hayes 1980), that the semantics of frames can be determined on the basis of predicate logic and that the syntax of frames depends on special implementational goals. So KRL, for example, is seen as a special programming language but not as a special way to give a semantic account of the facts of a world or of the knowledge about a world. And some (Chomskian) linguists

> have called frames "a cumbersome convention for the listing of facts".
>
> On the other hand, it would be unfair to reduce the work of those who design a frame representation language to matters of implementation and practical application. In fact, they challenge "a semantic theory of the classic kind"; they feel that knowledge representation is less a matter of relations between symbols and a world than a matter of relations between an 'interpreter', background knowledge and goals, symbols and a world. It is not so much the extensional aspects of symbols which are studied but the intensional, cognitive or pragmatic aspects, the context-dependent use of symbols by an 'intelligent interpreter'.

Citing Thompson's (1976) work on lexical frames to express a speaker's knowledge of kinship terminology in KRL (a frame-based formal knowledge representation language), Metzing (325) lists two requirements the content of a lexical frame should fulfill:

> °it should correspond intuitively/empirically to the knowledge of a natural language speaker;
> it should provide a formally satisfactory basis for the definition of terms.

Lexical frames support a semiotic approach to representing word knowledge. Lexemes, sememes, etymemes, morphemes, phonemes are all emic units joined systematically to one another along vertical and horizonal dimensions.

The model and composition relations reflect the hierarchical structure of the lexicon in which each more specific entity is an instance of a more general one, and where each entity is describable in terms of its parts. Information flow between model and instance is unidirectional from the more general to the more specific. Using terminology borrowed from cognitive science, we refer to this process as **property inheritance.** Composite relations are described by Miller (1981:180) as similarly unidirectional, i.e.

> unilateral dependences where one element determines or presupposes another, but not necessarily vice versa: the morpheme ox invariably determines the plural allomorph -en, but -en does not necessarily presuppose the morpheme ox, for it is also the plural suffix of the words children and brethren.

On the other hand, companion relations such as exist between collocates seem in principle to Miller

> to be bilateral dependences where one word predicts and syntagmatically implies the other and conversely: juvenile preducts delinquency and delinquency predicts juvenile although the predictive strength is probably greater in the first direction. since a collocational relation should preferably be viewed as an interdependence or interrelation, a unidirectional descriptive approach can only partially capture its true nature.

Every entity in the lexicon is at once a whole and an instance. It is the realization of some model as well as the composite realization of its parts. This is the vertical dimension. The horizontal dimension includes the lexical constraints imposed by heads on modifiers as well as the constraints imposed by modifiers on their heads.

	Dimension		Direction	
Relation	Vertical	Horizontal	Uni-	Bi-
model	✓		✓	
composition	✓		✓	
companion		✓		✓

Table 1

The word is realized as part of a system or network of relations. From the recognition that some entity is an instance of some model, we infer that generalizations true of the model are also true of the instance unless overridden by properties of the instance previously specified in advance.

This is stated by Hudson as the **selective-inheritance principle** (1984:18):

Selective Inheritance Principle

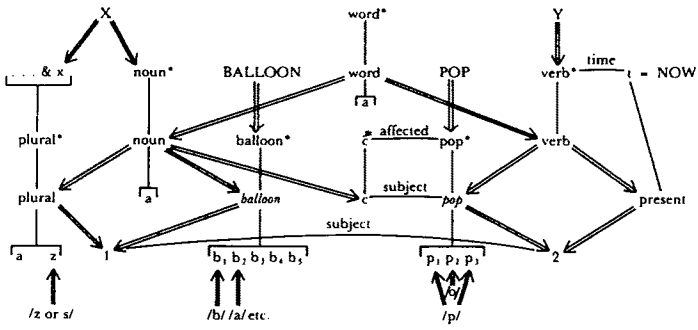
> **If I is an instance of M, then any proposition which applied to M must apply to I as well (with 'I' substituted in it for M), provided this proposition does not contradict any proposition which is aheady known to apply to I.**

Hudson describes the cognitive aspect of his theory as follows:

> Let us assume that the hearer approaches a particular utterance armed with a grammar for the language concerned, plus the selective-inheritance principle; and that they actually want to understand the utterance, with all this entails in terms of mental effort. the aim will be partially achieved once all the linguistic entities in the utterance have been linked, as instances, with stored linguistic entities; the other part of the operation will involve pragmatic inferencing which takes the hearer well beyond the stored knowledge of words and their parts. So we can present the hearer with three separate tasks:
>
> (a) decide which stored entity is the model for each perceived entity;
>
> (b) exploit the information in the stored entity, especially as regards its semantic and contextual implications;
>
> (c) draw any relevant conclusions from the output of the second operation.

A lexical frame is itself a model for the more specific instance of the word in context. Inspite of the fact that there is no 'perfect' match between model and instance, the instance being more fully specified than its model, the 'intelligent interpreter' can still make the connection by drawing on certain generalizations leading to the 'best,' most probable match between model and instance.

This same relation, model to instance, extends upward through a hierarchy of generalization to the concept of word. This is illustrated in Hudson's graphic representation of the structure for the word-string 'Balloons pop.' (see Figure 2).



The two elements comprising the word-string 'Balloon pop,' 1 and 2 are linked to one another in two ways as Hudson explains,

> First there is what we might call their 'stored' relations, as shown in the grammar. One such relation is what would traditionally be called their 'paradigmatic' relation, reflected in the instantiation hierarchy (they are both instances, ultimately of words). Another is the relation shown between "pop" and the category 'noun', via the former's subject [named "c" in Figure 2]; in prose, the grammar says that "pop" takes as subject a word which is an instance of 'noun.' We might call this a 'stored syntagmatic' relation. Apart from their stored relations, there are temporary relations, between 1 and 2 as such, in that 1 is shown as the subject of 2. This relation is just a particular instantiation of the general, stored, relation between "pop" and whatever its subject is.

From Figure 2 we note that the entity 'word' sits at the top of an is-a, or instantiation, hierarchy. It is the pillar on which Hudson's theory rests; that which "unifies all that we have to say about language in general" (5).

3.0 Beyond words

The entity 'word' is the upper bound in a theory of language structure where syntax is explained along lines similar to that suggested by John Hewson in a paper presented at the tenth annual conference of LACUS in 1983:

> This leads to the suggestion that syntax is essentially word based, since words in a language like English fit together in certain ways, like the parts of a construction set: adjectives are dependent upon nouns, verbs upon subjects, adverbs are tertiaries, dependant upon prior predications, and so forth.
>
> (1984:222)

Hudson claims, for example, that "the semantic structures for the various syntactic clause types based on 'mood' - declarative, imperative, interrogative and exclamative... are part of the knowledge-structure which is associated with a string of words, and which is derived almost exclusively from the words in the string" (1984:186).

I cannot accept Hudson's claim that a clause is simply a string of words whose structure "is the sum of the structures of the words in the string" (Hudson, 1984:31). Rather I would argue that clauses, as well as other semiotic units, "obey the Gestalt principle of having overall properties transcending the mere sum of their parts, and functioning in their contexts as integrated wholes" (Garvin, 1985:57). As the instantiation of some text, a clause inherits properties from the text-as-model which is itself realized in relation to the context of situation.

Hudson may regard his word grammar as a 'radical' alternative to the likes of phrase-structure grammar and other more mainstream approaches which confine the scope of their analyses to the structure of the sentence only. However, word grammer seems almost 'counter-revolutionary' in the face of Robert Longacre's appeal for a "vertical revolution in linguistics" (1979:249):

> It is not simply that systematic analysis and study of units larger than the sentence is possible, nor even that such analysis is desirable, but rather that discourse analysis is a rock bottom necessity, i.e. all linguistic structure must ultimately be related to the structure of context.

The problem with Hudson's approach to syntax is that it is singularly horizontal. Hudson sees "The

main relation in syntax is the 'companion' relation, between words which occur together, so we shall change from diagrams with vertical lines sitting on horizontal bars, to one with horizontal arcs linking co-occuring words" (1984:75). Lamb, however, in his presidential address before the eleventh LACUS forum, criticizes those who would emphasize the horizontal to the neglect of the vertical or semiotic dimension of language structure which he describes as follows:

> We are talking about the relationship between form and meaning, between expression and content. A language really consists of a large collection of those vertical or semiotic units, which are links between communicative functions or meanings and the means of expressing them.

The propositional, relational orientation of Hudson's word grammar, both in terms of the relations discussed and the form by which they are represented, owes greatly to the influences of the tagmemic, stratificationalist, and systemic models of language structure. Where it falls short of realizing a plausible theory of language structure is in its neglect of the meaning potential of lexicogrammatical units other than the word.

Hudson makes it clear that he is concerned that his theory be both psychologically and socially plausible - something he finds lacking in the more mainstream theories (1984a:151):

> I hope you will agree that at least the more mainstream theories of language structure are not very plausible either psychologically or socially--I have in mind theories as diverse as government-and-binding, relational grammar, generalised phrase-structure grammar and Montague grammar. Of course, their proponents would say that they do not care, because they were only concerned with linguistic structure, and from that point on I should have to concentrate on showing them that even with their restricted aims, word grammar could do better--which it could. But it seems to me very shortsighted to restrict one's aims in this way, knowing that sooner or later the crunch will come and all the details of your theory, which you have worked out with such loving care, may need to be changed drastically. For example, it is all very well to say that you are not interested in words like <u>hullo</u>, but you should at least have some idea of how they fit into your theory of language structure, even if you leave the details to be worked out by others.

I disagree, however, with Hudson's claim that word grammar "provides a view of language into which our knowledge of situations of utterance can be integrated in a very satisfactory

way" (1984a:159). Rather I would argue that without the clause-as-utterance, WG cannot succeed in providing an adequate framework for the description of text-as-"intersubjective event" (Halliday, 1981:42).

4.0 Conclusion

Lexical frames represent but one aspect of that vast scheme of things we call the world. Lexical frames make it possible to represent word knowledge. The slots of a lexical frame correspond to those relations identified by Hudson as existing between a word and its parts, companion(s), model(s), referent(s) and situation(s) of use. **Frame theory provides a uniform means for representing word knowledge as well as world knowledge.**

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Lexi-processing with LOGO*

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0. Introduction

Francis E. Knowles describes recent advances in computer science and technology as having opened up "a marvelous range of options for all whose labour of love is devoted to the creation of dictionaries" (1984: 301). In this chapter we will explore the potential of Logo as a programming language for lexicomputing.

Logo is many things to many people: a graphics language for children, a language for learning, and even a language for artificial intelligence (AI). The growing popularity of Logo is attested to by an ever increasing number of books and articles on the language. While most attention has been given to Logo's graphics capability, few authors have explored Logo's potential as a **list processing** language. Logo's list processing potential may be compared with that of LISP, one of the most popular AI languages.

The same features that made LISP a popular programming language for AI combine with Logo's simplicity to produce a powerful candidate for incorporating advances in AI into lexicomputing.

1.0 LOGO OBJECTS AND PROCEDURES

After starting up Logo on your machine, the user receives the following invitation

```
WELCOME TO LOGO
?_
```

The question mark - ? - on the next line followed by the blinking cursor is the indication that Logo is ready for your first instruction. Enter the instruction

---

*This paper was presented at one of the evening workshops.

```
?PR "HELLO
HELLO
```

This simple instruction states a command **PRINT**, here abbreviated as PR, followed by the object to be printed. In this instance, the object is the word "HELLO. What happens next? Logo prints out the object on the screen

Other objects in Logo include lists and numbers

```
?PR [HOW ARE YOU?]
HOW ARE YOU?
?PR 21
21
```

Words may be composed of a variety of elements - **"DAY#4, "$4.25, "BELIEVE.IT.OR.NOT.THIS.IS.A.WORD** - so as long as they are preceded by quotes (**"**) and allow no intervening blank spaces. While anything enclosed in brackets is a lists: **[THIS IS A LIST]** and **[[THIS IS A LIST] IN A LIST]** and **[1 * 2]**. Words without quotation marks (") are treated as names for procedures. Procedures which are already defined and "built-in" to Logo are called **primitives. WORD (word1 word2)** is a primitive which combines elements into a single word

```
?PR WORD "RE "TURN
RETURN

?PR (WORD "ABC "DEF "GHI)
ABCDEFGHI
```

Operations that form lists include LIST and SENTENCE. While **LIST (object1 object2 ...)** makes a list out of its inputs, **SENTENCE (object1 object2 ...)**, also abbreviated as SE, runs the elements of its inputs together into one list.

```
?PR (SE [A] [B] [C])
A B C
?PR (LIST [A] [B] [C])
[A] [B] [C]
```

FPUT (object list), "FirstPUT", inserts a new first element into a list

```
?PR FPUT "JOHN [IS MY FRIEND]
JOHN IS MY FRIEND
```

LPUT (object list), "LastPUT", adds a new last element to a list

```
?PR LPUT "FRIEND [JOHN IS MY]
JOHN IS MY FRIEND
```

Just as there are operations to put words and lists together, there are also operations to pull them apart. **FIRST (object)** outputs the first element of either a word or a list

```
?PR FIRST "WORD
W
?PR FIRST [BILL AND JANE]
BILL
```

LAST (object) outputs the last element of the object given as input

```
?PR LAST "WORD
D
?PR LAST [BILL AND JANE]
JANE
```

BUTFIRST (object), abbreviated BF, outputs all but the first element of some object

```
?PR BF "WORD
ORD
?PR BF [BILL AND JANE]
AND JANE
```

BUTLAST (object), or BL, outputs all but the last element of object

```
?PR BL "WORD
WOR
?PR BL [BILL AND JANE]
BILL AND
```

Operations that output either "TRUE or "FALSE are called

predicates. **WORDP (object)** outputs "TRUE if its input is a word, "FALSE otherwise. We can define our own predicates either with **TO** or **EDIT.** For example, suppose we needed a predicate to tell us whether or not a word is alphabetically ordered before another.

```
?PR ALPHAP "JOHN "JOAN
FALSE
?PR ALPHAP "JOHN "JON
TRUE
```

Unlike some other computer languages, Logo does not allow one to use the predicates and to compare alphabetic characters, only numbers. However, the ASCII operation makes it possible to convert characters into their respective ASCII code (see your Logo manual for a complete listing for all ASCII codes).

```
?PR ASCII "A
65
?PR ASCII "B
66
?PR ASCII "C
67
.
.
?PR ASCII "Z
90
```

We now can write **ALPHAP (word1 word2)**

```
TO ALPHAP :A :B
IF EMPTYP :A [OP "TRUE]
IF EMPTYP :B [OP "FALSE]
IF ASCII FIRST :A > ASCII FIRST :B [OP "FALSE]
IF ASCII FIRST :A < ASCII FIRST :B [OP "TRUE]   !
     [OP ALPHAP BF :A BF :B]
END
```

If the ASCII code of the first character of :A is greater than that for FIRST :B, output is "FALSE - the words are not in alphabetical order. If on the other hand, ASCII FIRST :A is less than ASCII FIRST :B, output is "TRUE. The only remaining possibility is that both FIRST :A and FIRST :B are the same letter, in which case another call is made to ALPHAP. Note that input values are adjusted accordingly to BF :A and BF :B, so that a comparison of the next letters in both words will follow. The **conditional IF** statements in ALPHAP follow the formats below

IF (predicate instructionlist1)

or

IF (predicate instructionlist1 instructionlist2)

If the predicate in the above statement evaluates to "TRUE, run instructionlist1; if it evaluates to "FALSE, run instructionlist2.

3.0 WORDS AND LISTS

We have not yet covered all the primitives available with Logo for operating on words and lists. Primitives, as you will recall are those procedures built-in to the language. **COUNT (list)**, for example, is a primitive which outputs the number of elements in a list

```
?PR COUNT [A B C]
3
?PR COUNT [JOHN [FRIENDS [MARY TOM]]]
2
?COUNT [HOW MANY WORDS ARE THERE IN THIS LIST]
8
```

There is no primitive, however, for counting the elements or characters in a word. So we have to write it ourselves

```
TO LENGTH :WORD
IF :WORD = "[OP 0]
OP 1 + (LENGTH BF :WORD)
END
```

This is an example of a recursive procedure. Simply stated, a recursive procedure is one which includes a call to itself as one of the steps in its definition. Recursion is something like what happens when you position two mirrors so that they face each other. The reflection of one reflects off the other producing a gradually reducing image which seems to stretch on forever. Brian Harvey (1982: 166) explains further,

> In a procedural language, one procedure can use another procedure as a **subprocedure** to do part of its work. A language is **recursive** if a procedure can be a subprocedure of itself.

The plus sign shown here is the mathematical sign for addition. It is an operation like any other. LENGTH outputs

1 +

as many times as there are characters in the input word.

In the example

```
?PR LENGTH "MANY
4
```

LENGTH makes a total of four recursive calls to itself

```
LENGTH "MANY
IF :WORD = " [OP O]
OP 1 + ( LENGTH "ANY
    |        ...
    |     OP 1 + ( LENGTH "NY
    |        |        ...
    |        |     OP 1 + ( LENGTH "Y
    |        |        |        ...
    |        |        |     OP 1 + ( LENGTH "
    |        |        |        |     IF :WORD = " [OP O]
    |        |        |        |                   |
    |        |        |        |                   |
    1    +   1    +   1    +   1    +              0
```

Suppose, on the other hand, it were possible to simply repeat LENGTH for every member of :LIST without defining a special procedure to do just that. Such a solution would be considered iterative and not recursive. **Iteration, after all, means repetition. MAP procedures** output a list of output from the repeated application of some procedure to every element of some input object. For example

```
?PR MAPS "LENGTH [LOGO IS POWERFUL]
4 2 8
```

MAPS repeats LENGTH for every member of the input list, and outputs a list of the output from the repeated application of LENGTH. APPLY, another utility program, lets us SUM up the values in the output list

```
?PR APPLY [(SUM] [4 2 8]
14
```

ITEM (n list) is a primitive which takes as input a number and a list and outputs the element in the nth position of the list.

```
?PR ITEM 3 [THE WAY WE WERE]
WE
?PR ITEM 5 [ONE TWO THREE FOUR FIVE SIX SEVEN]
FIVE
```

Again, however, there is no primitive to identify the nth element of a word. instead a user-defined procedure, **IDPOS (n1 n2 word)**, identifies those elements of a word occupying that position within the word marked off by n1 and n2.

```
?PR IDPOS 3 5 "INTRODUCE
TRO
?PR IDPOS 3 3 "CATS
T
?PR IDPOS 3 5 "WE

?PR IDPOS 1 3 "WE
WE
```

IDPOS is defined as follows

```
TO IDPOS :N1 :N2 :WORD
IF (LENGTH :WORD) < :N1 [OP "]
IF (LENGTH :WORD) > :N2 [OP IDPOS :N1 :N2
   BL :WORD]
OP WORD (IDPOS :N1 :N2 BL :WORD) LAST :WORD
END
```

In the example given earlier

```
?PR IDPOS 3 5 "INTRODUCE
```

since we want to output only those characters from position 3 through position 5 of the word "INTRODUCE, we are not interested in those characters in positions numerically greater than 5 or less than 3

```
I N T R O D U C E
1 2 3 4 5 6 7 8 9
```

The problem is one of identifying which character is in what position. LENGTH tells us how many characters there are in a word. The position of the last character is always whatever is LENGTH of :WORD. The last character "E is in position 9 of "INTRODUCE. Because 9 is greater than 5, instructionlist1 is run

```
...[OP IDPOS :N1 :N2 BL :WORD]
```

On the next recursive run of IDPOS, LENGTH "INTRODUCE evaluates to 8 and on this goes until we reach the letter "O

```
I N T R O D U C
               8

I N T R O D U
             7

I N T R O D
           6

I N T R O
         5
```

At this point LENGTH "INTRO is neither less than 3 nor greater than 5, but rather equal to 5. Since both prior IF statements evaluate to "FALSE, we end up at the last step in IDPOS

```
OP WORD (IDPOS :N1 :N2 BL :WORD) LAST :WORD
```

WORD combines the last element of what remains of :WORD - in this case "o - with whatever is the output of further recursive calls to IDPOS

```
                WORD ( IDPOS 3 5 'INTR ) "O

          WORD ( IDPOS 3 5 "INT ) "R

     WORD ( IDPOS 3 5 "IN ) "T
```

If LENGTH :WORD is less than :N1, IDPOS simply outputs an empty word

```
IF LENGTH :WORD  :N1 [OP "]
```

INWORD (word element n) inserts an element into the nth position of a word

```
?PR INWORD "LABOR "U  5
LABOUR
```

In this example, we have instructed INWORD to insert "U into position 5 of the word "LABOR. Note that the definition for INWORD contains IDPOS:

```
TO INWORD :WORD :ELEMENT :N
OP (WORD (IDPOS 1 (:N - 1) :WORD) :ELEMENT (IDPOS :N
      (LENGTH :WORD)  :WORD))
END
```

REMOVE (item list) removes an element from a list

```
?PR REMOVE "A [A CAT AND A RAT]
CAT AND RAT
?PR REMOVE "SAM [SAM THE RECORD MAN]
THE RECORD MAN
```

One solution is suggested below

```
TO REMOVE :ITEM :LIST
IF :LIST = [] [OP []]
IF EQUALP :ITEM FIRST :LIST [OP REMOVE :ITEM    !
BF :LIST] [OP FPUT FIRST :LIST (REMOVE     !
:ITEM BF :LIST)]
END
```

:ITEM is compared against every member of :LIST, one by one
IF EQUALP :ITEM FIRST :LIST...

Where there is a match, REMOVE simply ignores that first element of :LIST and proceeds directly into another recursive call to itself. When no match occurs and IF evaluates to 'FALSE, instructionalist2 preserves FIRST ;LIST by FPUTing it onto the output of further recursive calls.

We find ourselves with a more difficult problem when trying to define a procedure to remove designated characters from a word. **OUTWORD (element word)**, for example, does for words what REMOVE does for lists

```
?PR OUTWORD "N'T "DON'T
DO
?PR OUTWORD "IRST "FIRSTPUT
FPUT
```

```
?PR OUTWORD "' "IT'S
ITS
```

Note that OUTWORD deletes single characters as well as multiple character strings. Observe what happens in the case of the second example given above. The element to be removed, "IRST, is four characters in length, so initially we must compared "IRST with the first four characters of the word "FIRSTPUT to see if we have a match or not

```
IF EQUALP "IRST "FIRS [...
```

You are probably asking how we identified the first four characters of the word "FIRSTPUT. Using IDPOS, of course

```
...(IDPOS 1 (LENGTH "IRST) "FIRSTPUT)...
```

No match, but like REMOVE, OUTWORD is recursive. The first character of "FIRSTPUT, "F, is retained, while we continue our comparison of "IRST against the first four characters of 'IRSTPUT (or BF "FIRSTPUT)

```
...OP WORD "F ( OUTWORD "IRST "IRSTPUT )
```

This time a match is made. However because we need to delete every instance of "IRST from what is left remaining of the input word, the process continues with the instruction to compare "IRST against the input word minus the instance already discovered

```
OP OUTWORD "IRST "PUT
```

Notice however that the character string to be removed, "IRST, is now longer than the input word "PUT. In which case we might just as well output what is left of the input word

```
IF LENGTH "IRST  LENGTH "PUT [OP "PUT]
```

The whole process might be illustrated as follows

```
OP OUTWORD "IRST "FIRSTPUT
        OP WORD "F (OUTWORD "IRST "IRSTPUT)
                OP OUTWORD "IRST "PUT
                        OP "PUT
```

The definition for OUTWORD reads as follows

```
TO OUTWORD :CHAR :WORD
IF (LENGTH :CHAR)   (LENGTH :WORD) [OP :WORD]
IF  EQUALP :CHAR (IDPOS 1 (LENGTH :CHAR) :WORD)     !
      [OP OUTWORD :CHAR (IDPOS (LENGTH :CHAR)       !
      + 1) (LENGTH :WORD) :WORD)] [OP WORD FIRST    !
      :WORD (OUTWORD :CHAR BF :WORD)]
END
```

4.0 Summary

Lexi-processing means programming a computer to manipulate words whether it be to compare, sort, count, put them together or take them apart. Logo, a symbol-manipulation language, makes an ideal choice for lexicographical research.

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VIII

SOCIOLINGUISTICS, PSYCHOLINGUISTICS, NEUROLINGUISTICS

AN INVESTIGATION OF GENDER-BIAS AND WRITTEN LANGUAGE

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Barely fifteen years ago, linguists began to examine the issues in gender and the English language. Early studies often emerged as a feminist response to long-standing assumptions and claims about men's and women's language. A common argument was that women's language reflected women's second-class position in American society. Several researchers began to attack sexist language--words and phrases that they argued served to keep women in their (second-class) place and shaped our views of men and women and their respective and unequal roles. The outcome of that vein of inquiry has been a heightened sensitivity to sexist language, the adoption of non-sexist guidelines by editorial boards at most publishing houses, and a renaming of many occupations (cf. Miller and Swift, 1980). Yet another line of inquiry emerged as other researchers attempted to gather evidence either to support or refute the standard claims about gender differences in language that had come from Jespersen (1922). From the research of Robin Lakoff (1975) and Mary Ritchie Key (1975), their collective claims established a new set of characteristics of women's speech-the use of tag-questions and hedges, a preference for "nice" words and correct (if not hyper-correct) forms, more varied intonation patterns and an adherence to "women's" topics--merely reflecting women's powerless, second-class position in society.

Fortunately, many linguists were dissatisfied with the research methods and findings from Lakoff's study. During the second decade of gender and language study, linguists have sought empirical evidence of gender differences and examined closely the contexts in which men and women talk. From this recent research a very different picture of gender and language has emerged: (1) most of the features previously marked as "female" have also been shown to occur in males' speech; (2) the sociolinguistic context is a greater determinant of which features speakers use rather than gender; (3) perceived gender differences in language are the result of listeners' stereotypes of such differences rather than the existence of any real differences. A modification of the last point forms the basis of this study.

The above summary traces the nature of inquiry regarding the spoken language of men and women. A parallel, yet more limited body of research has accumulated about gender differences in writing, offering some sketchy but similar findings. As our heritage of female writers assuming male noms de plume gives evidence, much bias against women's written voice has been strong and restrictive. The purpose of the following discussion is not to

survey the field of feminist literary criticism or feminist theories of linguistic style. Instead, its purpose is to extract from relevant studies the evidence which verifies or invalidates the claims about the markedness of the linguistic and rhetorical features of women's writing.

As with oral language, women's writing, especially fiction, has traditionally been devalued because of the narrow topics they allegedly choose to write about, the assumption being that men write about more universal topics. Women's writing is also said to be more hysterical, more emotional and more indirect. If these claims ring familiar, they should; they are almost identical to the views held about women's oral language. Likewise, just as with research on oral language, empirical evidence has accumulated to dispute most of these claims about women's writing. Mary Hiatt (1977) conducted a study of men's and women's fiction and non-fiction in which she challenged the common stereotypes of men's and women's writing. She analyzed 100 fictional and non-fictional books, 50 by men and 50 by women, and concluded that men and women do write differently but not in ways offered by the popular stereotypes. Of her five areas of stylistic investigation, four guided the selection of the two essays used for this study and are, therefore, discussed below. First her sentence-length analysis reveals that men are wordy, especially in their non-fiction, and women are terse--findings which contradict popular notions. Second, also contrary to stereotyped beliefs, her investigation into tone and logic also shows that men display more excitability as evidenced by their use of the exclamation mark. Women offer more reasons and justifications and fewer examples and conclusions in their logical arguments. Third, Hiatt finds no differences in the number of -ly adverbs but interesting differences in their respective modification patterns with women using adverbs to modify adjectives more than men do. Fourth, she looks at claims regarding men's use of vulgar words and women's use of "polite" words, finding little evidence to support either.

In face of the persuasive evidence to the contrary, the stereotypes about women's written language persist as tenaciously as those about their oral language and inhibit women (and girls) from exercising and developing authentic voices which bear "author-"ity. It is difficult to identify the sources of the pressure on women to talk and write like men. In the home or community, a girl may be socialized to use the stereotyped linguistic features in most contexts when she is young but encouraged to use "male-"marked features in other contexts as she matures without having explicit reasons for a choice. It follows that a maturing young woman can develop a socio-linguistic insecurity which may account for the occasional appearance of sex-marked, inappropriate language in her writing and speaking.

Throughout her life, a woman may receive clear messages and rewards for using non-female language. For career women, a version of "Dress for Success" in language styles urges women to avoid "female-"marked language, verbal and non-verbal, in order to gain credibility, power, and status in a formerly "man's

world" (Stone and Bachner, 1977). Less explicitly, girls may receive educational rewards to adopt a male linguistic style. As traditionally taught in English classes, "good" writing is direct, logical, formal and distant--all "male" rhetorical features which are highly valued and rewarded (Farrell, 1979). Aside from high grades, though, how or even if teachers attend to gender-marked language is not evident. Several studies document that listeners attribute features of oral language to one gender or the other based on the stereotypes they adhere to, especially to females (cf. Kramer, 1974; Thakerer and Giles, 1981). This tendency is not studied in readers' responses to written language.

The study being reported here was designed to measure the sensitivity a group of English teachers shows towards "male" and "female" stereotyped features in written language. The hypothesis was that male and female teachers may exercise a gender bias in responding to or evaluating writing which bears these stereotyped gender- marked features. To test this, the faculty of the Department of English at Southern Illinois University at Edwardsville both full- and part-time, and the graduate teaching assistants (a total of 42) were approached to participate in the study. A small but dedicated group of 12 agreed. They were told only that they were to write comments on two essays as they normally do when they want their students to revise their papers. They were not told the true purpose of the study because to do so might have made the participants too conscious of, too selective in, the features they observed.

Finding the two essays used for the study posed the greatest difficulty. Donald Lance, professor of linguistics at the University of Missouri--Columbia, suggested that ideally the essay or essays to be used ought to be real products written by a male and female student in order to be authentic representations. To guide the selection of the two essays used in the study, a list of the most common stereotypes about male/female writing was created (see chart below).

FEMALE	MALE
"female-" appropriate topic	"male-" appropriate topic
correctness	ungrammaticality
sentimentality	logicalness
tentativeness	forcefulness
"nice" adverb and adjective use	vulgarity and slang use
loquaciousness	terseness
"female" word choice	"male" word choice

Since many of these features have already been discussed in this paper, only a few edifying remarks remain necessary. As for topic choice, one charge against female's writing is that the topics are narrow and related more exclusively to women's interests while men's writing addresses more universal topics. As any rhetorician, stylist or linguist understands, such claims deny the role of audience and purpose in topic selection, but that is another issue. As for content and presentation, as previously

presented, women's writing is said to be more "gushy," more emotional, and lacking commitment to their argument. Men's writing is alleged to more forceful and direct and strongly and logically reasoned. Such impressionistic judgments may have some justification if the work of Kohlberg (1982) and Gilligan (1982), in which the moral decisions of men and women are examined in their writing, are correct in claiming that men and women differentially develop arguments because of their socialization. Women are socialized to value relationships and may thus orient to their arguments in personal, emotional ways; men are socialized to value personal rights and truths and thus argue their positions on more univeral grounds.

The seven items on the FEMALE and MALE list (above) were used in surveying over one hundred freshman English students' placement essays. Every effort was made to find both a female and male written essay for each of the five topics included in the sample; unfortunately, the two selected address different topics but exhibit many of the stereotyped features for their respective gender. (See appendix for the essays selected.)

The male writer's essay displays several of the features from the list. Its topic and argument seem "male" appropriate. The essay recounts an event in which the boy was caught drinking under age. Challenging authority and drinking have a long tradition in our society of the kinds of behavior open to adolescent males. The argument in the essay, though, is not that the boy was wrong and had been caught, a lesson one could learn from, but that in his being caught a greater violation had been committed against him. This essay contains examples of language marked as "male": the slang expressions like "split" and the vulgar expressions like "take a leak," "damn" and "pissed." In addition to several structural problems, this male writer uses the whole incident as an example to argue for his rights and better justice.

The female writer's essay displays several, though fewer, of the "female-"marked stereotypes. The most striking is her choice of "female" words like "divine," "sweet," "gentleness," "precious," and qualifiers "so," "simply," and "pretty." There is a personal engagement with her topic as evidenced by her choice of "envy" in the second paragraph and echoed in "admire," "impressed," and "value" later in her essay. Instead of offering strong examples, she uses her regard for Benjamin Franklin as her reasoning.

The two essays were then distributed to the faculty participants. They had been divided into two groups containing a nearly equal number of male and female readers. One group received the essays just as they were written; the other group received the same essays with the writers' genders switched. This was done in attempt to see if the gender of the writer influences the reader's attention to the linguistic/stylistic features described earlier. At the top of each essay, the readers were asked to indicate their own gender and age category. In the original design of this study, one notion was that men and women might display some difference in their gender bias. It was also thought that the age of the reader might also influence their responses. The

results, discussed below, suggest gender is less significant than age in influencing how readers respond to the essays. Most of the readers under the age of 45 years old paid no attention to the male writer's use of informal, vulgar or slang words. Their responses indicate a shift in tolerance for such language, a shift that has occurred in our society as a whole. In contrast, the two readers over the age of 55 years either commented on or circled the "male-" marked language as inappropriate. No such age split is evidence in their responses to the female writer's essay as is shown below. The findings of this study do not support the hypothesis that teachers, male or female, exercise gender bias in evaluating gender-marked written language. Furthermore, it seems that the gender of the writer does not figure in their evaluation. They attend to the same features regardless of the "gender" indicated on the essays they evaluated.

In every evaluation of the female's essay containing alleged "female-"marked features, the readers noted the use of "divine" as inappropriate, unacceptable or hyperbolic regardless of the gender indicated at the top of the essay. Some of the readers also noted occasionally the use of other "female-"marked words like "sweet," "pretty" and "simply" as in need of revision and "so" as overused. One reader wrote on the female-turned-male writer's essay that such words made the essay "sound like a 'Valley Girl' speaking." As for the content, one reader noted that the writer's wordiness created an unauthentic voice. Two readers viewed the content as superficial and in need of more evidence. None of the readers noted the female's personal orientation to the topic.

In the evaluations of the male's essay containing the so-called "male-" marked features, every reader corrected various structural and mechanical problems. While there were few agreements on what was incorrect or ungrammatical, they attended most regularly to comma and modification problems. Most readers ignored the other "male" language features. But when they did not, their comments indicate different levels of tolerance. One female reader, over the age of 55, commented on the general vulgarity and slang in the second paragraph and advised the student to eliminate the substandard language. Another reader noted only the use of "pissed" as slang and asked the student for a better word. Another reader told the male-turned-female writer that such language made "her" sound like an immature high schooler. (Note the generic.) One male reader, ironically, corrected the use of "damn" to "damned." Overwhelmingly, like the comments on the female's essay, those on the male's attended more to his confusing premise and the lack of evidence to make his case.

What these patterns suggest is that readers may attend to certain features which have been stereotyped as "female" more than as "male" <u>not</u> because the features are associated with females but because they are not considered part of "good" writing. As Farrell (1979) has pointed out, what has come to be accepted as good writing stems from a male rhetorical tradition. Not all of the features of such a tradition are the features of stereotyped "male" writing. It seems that English teachers have internalized fea-

tures of what is considered "good" writing as generic, not as "male." Consequently, they evaluate all student writing according to the same qualities, regardless of the student's gender. The evidence of this study indicates that teachers do not attend to some of the gender-marked features. Yet, when they do, they show no gender bias. They seem to expect the same kind of writing from each gender. It might be argued that this expectation in itself shows a gender bias, but the results of this study do not support such an argument. Given the small nature of this study, other, larger studies into the responses of different readers, not just English teachers, need to be conductd to verify further that the writing of males and females are not judged because of the use of stereotyped gender-marked language. Such evidence would substantiate the argument that readers do not judge written languae on the basis of perceived gender stereotypes as listeners do of oral language. It also leaves open the possibility that, as Hiatt has shown, the actual differences between men's and women's writing is minimal and gender bias towards perceived differences is non-existent. To continue to argue that strong differences and resultant bias exist leads to unproductive research.

APPENDIX

Female Student's Essay

Who would I like to be? If it were possible, I think it would be divine to be an inventive person such as Benjamin Franklin.

Why, you ask? Well, you know, that could be answered in various ways. As I ponder on this thought, I feel that Mr. Franklin was a man of wisdom. He was the father of objects that are still pretty important today. I envy his imagination and curiosity that brought about: false teeth, eye spectacles, and mostly, electricity.

Not only do I admire this man, but also his decade. Franklin lived in the time of scientific revolution. It must have been so fascinating to see the world moving and growing so quickly. To see that men were becoming independent of one another and creating a foundation for posterity.

Searching back on what I have said, I know that I should probably include a third and very important part that I mistakenly left out. From what I have read about this individual, he appears to be a sweet man.

It is not for sure to say that this is true, but I personally value as precious honesty, gentleness, and simple scruples which were impressed on my mind.

To make my trip to the past simply the ultimate, I would like all I have read to be true about Mr. Benjamin Franklin. If not, then I guess I wouldn't want to be him, but rather just the image I have of him. It is not the fame of the person I admire, it's the life accomplishments.

Male Student's Essay

There was one point in my life that comes to everyone. This point is one where I was forced to do things that I should not have had to do by my rights . . . so I thought.

One night a friend (my best) and I didn't have any dates. We decided to go out and have a good time. So, we went and purchased some beer. Now, I knew that drinking in the car was unlawful, so we went in the woods behind the church and left the car in the lot. About an hour later we finished and decided we'd better split for home. We left the spot. When we reached the edge of the woods I had to stop for a second to take a leak. Then we headed out of the edge of the woods. As soon as we came out two headlights came screaching at us. So we ran. As we ran a man with a flashlight followed us. Well, I became mad and exhausted so I hid. By this time the man was walking far behind. I let him get closer. It was a damn cop! He didn't say halt or flash his lights or anything. When I found this out I came out. Then when he reached me he arrested me! I was really pissed, not only did he arrest me but he called the K-9 unit and caught my buddy, too. When I asked what the charge was, he said "I'll make up one!"

After being questioned and not being treated good, he let me out of jail and gave me a seventy five dollar ticket for disorderly conduct and let me go. He said I could try to take it to court if I wanted to but I would have slim chances and it would cost more. So I felt I was <u>forced</u> to pay the fine.

From this experience I learned that some police misuse the law and we need new laws so others will not be subject to harrassment by police or agents. I don't think it should cost more money and time to set things right. Courts should be functioning a little better for a more <u>fair</u> system for everyone in America.

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SEX DIFFERENCES IN BABY TALK: THE EFFECT OF LANGUAGE ENVIRONMENT ON COMMUNICATION AND COOPERATION

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INTRODUCTION

As first noted by Malinowski in 1923, people adjust their speech according to the many variables of the "context of situation." Along with the "where" and "when" variables of context are "who" and "whom" -- the interlocutors. For example, people speak differently to those they perceive to be linguistically incompetent, yet capable of interacting socially, e.g. foreigners and young children. These special ways of speaking are known as simplified registers. The register of speech used when speaking to young children is generally called Baby Talk (BT). Beginning with Brown and Bellugi in 1964, researchers have investigated the special characteristics of adult to child speech and the role it plays in language acquisition (see Snow and Ferguson 1977, de Villiers and de Villiers 1978 for reviews). Many argue that BT contains special design features that facilitate language acquisition (e.g. Snow 1972, de Paolo and Bonvillian 1978). BT also shows features that are found more frequently in female speech than in male speech; e.g., a higher and wider range of pitch, more emphatic stress, more repetition, and hyper-correct forms are some of the most important of the 100+ features that constitute English BT (for a more complete listing of BT features see Brown 1977 and de Villiers and de Villiers 1978). Although most of the BT research thus far has involved mother's speech, both males and females (even those as young as five years) also produce similar modifications in their speech (Gleason 1977). Because adults of both sexes are known to react differently to males and females, even with neonates (Lewis 1972), some researchers have begun to investigate the particular differences in men's and women's speech to young children (Gleason 1975, Malone and Guy 1982, Gleason and Greif 1983, McLaughlin et al. 1983).

Psychologically, pets often function as child substitutes for their owners (Lorenz 1964); people often interact with pet animals much the same way that they interact with very young children. Just as the behavior of a parent affects the development and behavior of children, the behavior of pet

owners is likely to be of similar importance (Hamilton and Robbins 1981, 1985). Pet owners often treat their pets as perpetual infants, referring to themselves as the pet's "mommy" or "daddy." Although BT is primarily used when speaking to children, it has been suggested that BT is also used with animals (Brown 1977, Ferguson 1977, Gleason and Weintraub 1978). Hirsh-Pasek and Treiman (1982) have shown that language used in speaking to dogs closely resembles BT. Neapolitan (in prep.) has obtained similar findings for language used in speaking to parrots.

The present study investigates sex differences in men's and women's speech when interacting with a talking psittacine bird. Features of BT were examined to determine which features men and women use and with what frequency. It was hypothesized that women would be more successful communicators than men because of their more frequent use of the communication-facilitating features of BT.

SUBJECTS AND PROCEDURES

The avian subject (AS) is a ten-year-old African Grey parrot (Psittacus erithacus) who has been trained, during a nine year period, to engage in two-way communication with humans. He knows the labels for thirty items, five shapes, six colors, and recognizes quantities up to six (Pepperberg 1981, 1983, in press).

Thirty-two human subjects (HSs) were used--eight men and eight women who had considerable contact or experience with children, and eight men and eight women who did not. HSs had not interacted with the AS before this study. Half the HSs were told that the AS was a male, named Alex, and half were told that the AS was a female, named Alice, in an effort to see whether the perceived sex of the AS would have an effect on language input from HS's. Because the AS is usually called Alex,[1] the feminine name Alice was chosen for its phonological similarity to "Alex." It was necessary to chose a feminine name phonologically similar to the AS's usual name because it was suspected that the AS would not pay attention to an unfamiliar sounding name.

Two HSs were video-taped one day each week. The data for the "Alex" portion of this study were collected over the course of eight weeks during the summer of 1985. The data for the "Alice" portion of this study were collected over the course of eight weeks during the spring of 1986. The specific interactions examined were (the correct verbal responses are underlined): (1) asking the AS to identify a cork (used to clean the beak), (2) asking the AS to quantify two, three, or four items displayed on a tray, (3) asking the AS to

identify the color of a yellow wooden popsicle stick, and (4) asking the AS what is different about exemplars which are identical except for color.[2] During the queries, the AS is perched on "the gym," a wooden perch 92cm long and 142cm high. He may walk the length of the gym, but he cannot get down on his own. HSs were standing during the interactions. Each HS had up to five minutes to complete the interaction, with a five to ten minute break between interactions. HSs were given minimal instructions on how to complete the interaction: (1) ask Alex/Alice to tell you what this is / how many is this / what color is this / what's different about these, and (2) you may let Alex/Alice touch or taste the item, but do not let him/her keep it until he/she gives you the correct response. The experimenter did not demonstrate how to complete an interaction and spoke to the AS as little as possible. When it was necessary to speak to the AS, the experimenter used her normal speaking voice as not to cue the HSs as to the "correct" way to speak to the AS. The experimenter was present in the room during the interactions, but was seated behind a partition. HS's could see the experimenter if they turned around, but the AS could not see the experimenter.

DATA ANALYSIS

The videotapes were transcribed and subject's utterances were divided into those addressed to the AS and those addressed to the experimenter. An average of over 100 utterances were available from each of the 32 subjects. In this part of the study I shall be primarily concerned with speech addressed to the AS. The written transcriptions were then subjected to a series of formal and informal analyses.

RESULTS

Success of Interactions

Total time to complete all interactions is presented in Table 1. Overall, women were more successful than men; i.e. they completed the interactions successfully in about half the time ($p=.00006$[3]). Interestingly in many cases (15) men were unable to complete the interaction within the five minute time limit (vs. 5 for women). However, there is no difference in time needed to complete interactions for males and females speaking to either "Alex" or "Alice." The only instance where men were more successful than women was on the number task to "Alex" (10:20 for men vs. 12:27 for women). This finding is especially interesting because Swacker (1975) has noted that men are more sensitive to and descriptive about number than are women. Subjects who had experience with children fared no better (in fact they did slightly worse) than those who did not have experience with children

(98:38 vs. 89:12). Perhaps experience with children doesn't make a person any better at BT than any other socialized human being. Research has shown (Gleason 1977) that children as young as five years use BT with younger siblings.

Utterance Length

Mean length of utterance (MLU), is computed by counting all of a speaker's words over a period of time and dividing that total by the number of separate utterances that a speaker has made. This yields an average length of sentence, except that it is a more general term, because speakers frequently do not speak in complete sentences. MLU is a good measure of sentence complexity; although short sentences are not necessarily simple sentences, speakers generally consider them as such and will speak in shorter sentences when they mean to speak more simply. I found only slight differences (p=.08) between male vs. female MLU to both "Alex" and "Alice" (see Table 2). This finding is not surprising in that several researchers have not found MLU differences for males and females using BT. (Gleason 1975, Blount and Padgug 1976, Golnikoff and Ames 1979, see however, Rondal 1980, Malone and Guy 1982, McLaughlin et al. 1983). In addition to being short in length, the simplest sentences take the form of subject-verb-object in the present tense. The addition of subordinate or coordinate clauses and past or future tense forms all serve to make the sentence more complex. I found males and females using an equal proportion of multi-clause sentences and sentences in past or future tense.

Utterance Types

Information on utterance types and an explanation of utterance type categories are presented in Table 3. Although research on men's speech to children has shown that men produce a higher percentage of commands (Gleason 1975, Malone and Guy 1982, Gleason and Greif 1983), I found males and females using about the same percentage of commands. However, this may have been caused by the nature of the interactions: getting the AS to make a specific vocal response. Significant differences (p=.02) were found for men's greater use of statements (.) and calling the AS by name (AS) and also for women's greater use of questions (?). Males may have used more statements because they tended to stray from the task more often (see below). Similarly, women's greater use of questions may have resulted from their tendency to stay on-task. Men's greater use of names has also been shown by Gleason and Greif (1983) for male day-care teachers speaking to young children. Although it was not statistically significant, woment tended to praise (@) the AS more and also tended to use more BT vocabulary (e.g. good birdie) when praising. Although men and women directed an equal percentage of utterances to the experimenter, men tended to ask

the experimenter for assistance more often. There were no differences in utterance types between "Alex" and "Alice" subjects.

Jocular and Pejorative Utterances

Examples of jocular and pejorative utterances are shown in Table 4. These types of utterances were made only by men. This finding is in accordance with Gleason and Grief's (1983) observation that fathers tend to use more pejorative nicknames with their children than mothers. Such name-calling casts the male in the role of the dominant disciplinarian. The need for the males to set themselves up as a dominant may have been further influenced by the presence of a female experimenter. In addition to pejorative utterances, men also produced more sentences uttered with a pejorative tone of voice. While some pejorative utterances may have been produced out of frustration with not being able to complete the task, if this were the case, one would expect to find similar utterances being made by unsuccessful women. Jocular utterances may also have been caused by frustration with the task, or the male's unwillingness to take the task seriously (e.g. subject c3m+, who turned to the experimenter and said "I feel silly"). There are few notable differences between pejorative and jocular utterances directed at "Alex" or "Alice," except that "Alex" is refered to as "buddy" and "sport," while "Alice" is told "Don't play hard to get."

Off-task and Inappropriate Language

Examples of off-task and inappropriate language are shown in Table 5. Here, "off-task language" is defined as language which is not aimed at accomplishing the task at hand and "inappropriate language" is defined as rare or adult vocabulary which is unlikely to be used with someone who has a limited command of English. Again, such comments are exclusively (except for one case) used by men. Such comments seem to result from either misjudgments about the AS's level of understanding or the male subjects' own disinterest or frustration with the task.

Inappropriate Strategies

Examples of inappropriate strategies are shown in Table 6. A strategy was labeled inappropriate if it assumed knowledge or ability which was far beyond what one might reasonably expect the AS to possess. For example, one could not reasonably expect the clue "it's a one-syllable noun" to be of any help to the AS for the "cork" task; it is not reasonable to expect the AS to have any knowledge of parts of speech. Again, it is interesting that these strategies are chosen by males only.

DISCUSSION

The data suggest that there are significant sex differences in communication with a talking parrot. However, these differences are less linked to the actual sex of the communicating individual than to culturally learned patterns of behavior which are more likely to be associated with one sex than the other. Being able to complete an interaction successfully is less linked to formal matters like utterance length or utterance type than to empathy and global strategies, e.g. (1) being able to quickly build a rapport with the AS, and (2) being able to monitor its reactions and accommodate one's own behavior to them. Studies have shown that women are generally more sensitive to verbal and nonverbal stimuli than men, and moreover, women read and respond to these cues with more accuracy than men (Argyle et al. 1970, Rosenthal et al. 1979). Perhaps this sensitivity and the ability to react to it is the greater part of being a successful communicator, rather than any other pattern of behavior. Although it is beyond the scope of this study to quantify this in any rigorous way, this is a very important factor for sex differences in communication, and communication/cooperation in general, and merits further research.

CONCLUSIONS

1. There are sex differences in the ways in which men and women communicate with a subordinate individual they perceive to have limited profficiency in language (be it bird or baby). Women are generally more successful at using language to establish and maintain communication in a relatively short period of time. The key to their success is the ability to quickly and correctly assess the interlocutor's level of understanding and to keep on-task. Although the way in which women use formal aspects of language (e.g. utterance length and type) may contribute to their success, the key to using BT most effectively seems to lie with less quantifiable aspects of language.

2. Men and women provide different kinds and quantities of linguistic information to children, animals, or to whomever they are speaking. Traditional sex roles are still in force and are being passed on to the next generation. Moreover, sex roles are being passed on without interlocutors necessarily being aware of what they are doing. Although subjects in this study were young middle-class college students who professed "liberated" values, when placed in an unfamilar situation where they had to perform, most relied on traditional modes of behavior. For example, one female subject refused to believe that she would ever use BT intonation or say "pretty birdie" until I showed her her portion of the

videotape.

3. If, as this study suggests, men and women provide different linguistic models to interlocutors, then more research into men's speech and sex differences in simplified registers is needed if we are to properly understand the effect of language environment on the development of language.

NOTES

[1]Although the AS is usually called "Alex" and referred to with masculine pronouns, we have no conclusive evidence that the AS is indeed a male. Because African Grey parrots are sexually monomorphic, it is not possible for even a trained observer to determine the sex of a parrot by sight. In addition, because of a lack of field studies, we know of few sex differences in behavior other than sexual behavior. The most commonly practiced method of sex determination is laparoscopy, which requires that the bird be anesthetized. Knowing the sex of the AS has never been necessary to our research. Therefore, due to the expense and risk to the AS's health, this procedure has never been performed.

[2]Quick explanation of the "different" task. Items may differ by color, shape or material (wood, rawhide, paper, plastic). The AS is shown two items and is asked how they are different. The AS may reply "color," "shape," or "matter" (for material).

[3]Significance levels are for Z-tests, calculated to examine the differences between males and females performances with "Alex" and "Alice." The Z-score measures how many standard deviations the two means are from one another. What I did was to take the male mean and subtract the female mean.

$$\frac{\bar{X}_m - \bar{X}_f}{\sqrt{(se\bar{X}_m)^2 + (se\bar{X}_f)^2}}$$

se = standard error of the mean

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TABLES

Table 1 -- Time to Complete Interactions (in minutes)

	Alex	Alice	Total	Avg. Tot. Time
M	55:52	64:21	120:43	7:29
F	32:43	34:24	67:07	4:11

Table 2 -- Average MLU (in words)

	Alex	Alice	Total
M	3.47	3.74	3.60
F	3.36	2.85	3.10

Table 3 -- Utterance Types

	M		F	
	No.	%	No.	%
?	1036	41	706	46
.	347	14	130	8
!	222	9	153	10
&	83	3	35	2
∂	73	3	123	8
#	176	7	141	9
AS	440	17	192	13
E	38	1	21	1

Key

? = (1) wh-questions, (2) yes/no questions,
(3) "can you," "would you," polite forms
. = (1) statements and sentence fragments
(2) conditionals
! = commands, "tell me....."
& = (1) non-word vocalizations, (2) whistles,
(3) imitations of the AS's sounds.
∂ = (1) "yes," "yeah," "right," (2) praise,
(3) restatement of correct answers
# = "no," "wrong," "bad"
AS = addressing the AS by name
E = language directed toward the experimenter

Table 4 -- Jocular and Pejorative Utterances

	M	F
Alex		
	"Alex, yo buddy" (x1m+)	
	"Be a sport" (x2m+)	
	"You're a silly" (x2m+)	
	"Sounds like a horse" (x3m+)	
	"Show me your tailfeathers" (x4m+)	
	"What the hell are you doing" (x3m-)	
Alice		
	"Don't play hard to get" (c2m+)	
	"OK bird"(c3m+)	
	"You're a cool parrot" (c3m+)	
	"Silly bird" (c4m-)	
	"Bird" (c4m-)	
	"I'm gonna shoot you" (c4m-)	

Table 5 -- Off-task or Inappropriate Language

	M	F
Alex		
	"I see your anxiety" (x4m+)	
	"We have to perform our task" (x4m+)	
	"What we have here is a failure to communicate" (x4m+)	
Alice		
	"You can only see out of one eye at a time" (c3m+)	"Don't be frustrating" (c4f-)
	"I bet you tell other people, it's just me" (c3m+)	
	"Do you know of a good night club in town" (c3m+)	
	"It's vocabulary" (c3m+)	
	"Do you have any inclination" (c2m-)	
	"I have a quantity of pink balls" (c4m-)	

Table 6 -- Inappropriate Strategies

x3m-	"it goes in bottle tops" (for "cork" task)
	spells "C-O-R-K"
c3m+	"this is a C-O-R-K"
	"it's a one-syllable noun"
	"it begins with a C"
	addition strategy on the "number task"
c2m-	"I need an adjective"
c3m-	spells "C-O-R-K"
	asks "what color?" on the "what's different" task

THE SUBVERSIVENESS OF SLANG

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Because words and phrases that can be labelled slang are distinctive neither in morphological form nor in syntactic function, the term slang is difficult to define as a sub-set of the lexicon of a language. This has led to extended definitions of slang which focus on its effects rather than on its form. In the best attempt to define slang in this way, Bethany Dumas and Jonathan Lighter claim that "the most crucial feature" of slang is its use "to flout a conventional social or semantic norm" (12). More than a half century earlier George McKnight, in an excellent overview chapter on slang published in 1923, observed that "the spirit of slang is that of open hostility to the reputable" and frequently characterized slang as "irreverent" (46). In the early years of the use of the term, the anti-establishment quality of slang was obvious, for it was applied mainly to the special vocabulary of criminals, who, by definition, opposed the conventions and norms of established society. Over the centuries the term has been extended to apply to the vocabularies of other identifiable groups like jazz musicians, carnival workers, truck drivers, and college students who by and large live within the law but have developed a vocabulary in opposition to the standard language to maintain group solidarity. Groups like these more often violate the conventions of propriety rather than civil or criminal laws. But their cultivation of slang as an alternate vocabulary encoding their communal values is itself an expression of opposition to what is generally accepted.

Educators have always recognized the natural tension between slang and the standard language. At the turn of the twentieth century, Harvard professors James B. Greenough and George L. Kittredge expressed the attitude of the educational establishment to slang, "Now slang, from the very fact that it is slang, that it is not the accepted medium of communication, has a taint of impropriety about it which makes it offensive" (72). In the mid-sixties, a time more sympathetic to civil disobedience, James Sledd berated English teachers for proscribing slang, precisely because in doing so they deny to students one avenue for criticizing society: "When a teacher warns his students against slang, he reaffirms his allegiance to the social order that created him. . . . Genteel pedagogues must naturally oppose it, precisely because slang serves the outs as a weapon against the ins. To use slang is to deny allegiance to the existing order, either jokingly or in earnest, by refusing even the words which represent convention and signal status . . ." (699).

This paper examines this "subversive" quality of slang and shows how it serves students at one southern, state university.

The irreverent edge to slang grows from the circular function of language to create and maintain as well as to reflect social reality. M. A. K. Halliday's concept of antilanguage and Basil Bernstein's notion of restricted code* (both part of the larger consideration of how the forms and organization of language can be explained in light of its social functions) offer approaches to understanding the language of groups that customarily display slang, groups in which common experience is more important than individual expression.

An antilanguage is the language of an antisociety, which constructs by language an alternate reality set in opposition to some established norm. Although the distance between the two realities need not be great, the relationship is always one of tension. Halliday uses three examples of increasing complexity: the antilanguage of vagabonds of Elizabethan England, of the underworld of modern Calcutta, and of inmates of Polish prisons and reform schools. Among the characteristics he observes in these varieties are overlexicalization in areas of activities that set the group off from established society, metaphor as the ordinary mode of expression, and the typical use of the antilanguage for contest and display.

Antilanguages appear to be realizations of the type of code which Bernstein calls restricted:

> . . . the most general condition for its [a restricted code's] development will be based upon some common set of closely-shared identifications self-consciously held by the members, where immediacy of the relationship is stressed. It follows that these social relationships will be of an inclusive character. The speech is played out against a background of communal, self-consciously held interests which removes the need to verbalize subjective intent and make it explicit. The meanings will be condensed. . . . The non-verbal component (expressive features) will be a major source for indicating changes in meaning. These expressive features will tend to reinforce a word or phrase rather than finely discriminate between meanings. The utterances . . . will tend to be impersonal in that the speech is not specially prepared to fit a particular referent. How things are said, rather than what is said, becomes important. The intent of the listener may be taken for granted. Finally, the content of the speech is likely to be concrete, descriptive, and narrative rather than analytic and abstract (77-78).

As I have detailed in previous LACUS papers, slang displays the characteristics associated with a restricted code. A shared

cultural knowledge often allows for implicit, cryptic meaning, as in Wally and Beav as terms of address, an allusion to the television program "Leave it to Beaver," or from Chicago 'out of touch with reality', a shift from airhead to wind to the windy city. Meaning is often ironic or signalled by intonation rather than lexical choice, as in What a trip!, which can refer to an amusing film or a boring professor. Meanings tend to be strongly positive (awesome) or strongly negative (the pits), with little possibility for fine discrimination. A constantly changing store of evaluative terms can apply to a wide range of referents, like a sweet foul shot in basketball or a sweet BMW or a sweet exam. Linguistic varieties which arise from a restricted code need not be antagonistic to the greater social order, but in the instance of antilanguages, they are.

The types of slang in which users are farthest removed from the aims of established society can be expected to be the most subversive. Political revolutionaries aside, incarcerated prisoners offer the most extreme example. An extensive study by Inez Cardozo-Freeman of the language of prisoners in Washington State Penitentiary in Walla Walla from 1978-80 verifies the characteristics of antilanguages proposed by Halliday. Many synonyms exist for 'die', 'suicide', 'drugs', 'crimes', etc. Metaphor is ordinary, e.g., rock pile 'any kind of job'; sewer 'large vein for injecting narcotics'; magic wand 'police club'. Prisoners wield their common language much like a weapon, using it to release pent up aggression, to express fear and terror, to retaliate against their treatment, and perhaps to diminish their sense of guilt. According to Cardozo-Freeman, "Underground language expresses symbolically the reality of the prisoner's existential condition. Prison is obscene, profane, violent, terrifying, grim, cruel, inhumane, impersonal, ruthless, and dehumanizing. Underground language reflects these conditions" (27).

But what about college slang? Does it qualify as an antilanguage, creating its own reality at odds with the reality of the establishment?

College students by and large act within the law, and their slang is not cautiously secret--though because of its rapid turnover and its cultural allusions it is often incomprehensible to outsiders.

To be sure, college slang has some of the characteristics of antilanguages.

It is overlexicalized in some subject areas. Slang terms for drunkenness from just the past two school years provide an obvious example: ape, blasted, bleary-eyed, blind, blitzed, blotto, bombed, crocked, faced, feeling no pain, fried, fucked up, gone, hammered, in the wind, juiced, legless, lit, messed up, nice, on the floor, planted, plastered, plowed, polluted, right, ripped, sauced, schnockered, shit-faced, slammed, sloshed, ted, thick tongued, three sheets in the wind, throw down, tight-wadded, toasted, tongue-tied, tow up, trashed, twisted, under the table, wasted, whipped, zonked, and zooted. Perhaps because excessive

use of alcohol is both socially and legally unacceptable, getting drunk (or at least talking about it) is a favorite pasttime among college students. But in the sentence "Joe got drunk at the party last night," the substitution of one of the slang words just listed makes the sentence more than a statement that Joe drank too much alcohol. The attitude towards drinking excessively conveyed by the use of slang is at least non-judgmental, if not admiring, and allies the speaker with the person who has committed the social impropriety. The flippant attitude towards excessive drinking seems motivated more by a desire not to offend a peer than by a desire to rebel against authority.

Furthermore, overlexicalization in college slang tends to show up precisely in those areas which are taboo in the standard language--sex, bodily functions, death--not in areas that set students off most sharply from established society. In accepting the categories of propriety reflected in the standard language, student slang honors it in the breach.

For the most part, the opposition to authority in college slang manifests itself as a kind of flippancy or irreverence. As with the slang terms for drunk, many of their slang items have referential equivalents in the general vocabulary, but the slang item carries an additional element of indelicacy, like pork out 'eat' or goo food for 'oriental cuisine'. One target for this sassiness is, of course, the academic system. Slang pictures students as embattled, as in an athletic contest or war--always on the verge of being destroyed, for example, wasted by a quiz. The term school itself in current UNC-CH slang means 'to dominate, to prevail, to do something better than the opposition so that they learn from you', as in 'In the beginning of the game, Johnny Dawkins schooled Louisville with his driving layups.' The beneficiary of schooling is humiliated. Interestingly, college slang does not appear to attribute humiliation in the educational process to individual members of the establishment, as I have collected no slang terms for teachers, deans, librarians, or campus policemen--though I'm sure that there must be some.

Not surprisingly, slang terms for courses, grades, and buildings are numerous. Courses in Radio-Television-Motion Pictures are called rumptyvump. The grade A is an ace; C is a hook; D is a dog; F is a flag. The Pine Room dining hall is the Swine Room, and its fast-food section is called itzanotapizza instead of It's A Pizza. The Undergraduate Library is the Ugly. Nearby institutions of higher learning are UNC at K-Mart for UNC-Wilmington and The University of New Jersey at Durham and A Little Piece of New Jersey in Our Own Back Yard for Duke University.

Seldom is the opposition to authority political, as in the untypical example of pulling a Ronnie for 'doing something stupid.' Most of the time the irreverence of college slang is targeted at social mores, and the opposition to authority consists of breaches of good taste, and are often sexual. Take, for example, the following terms for 'public display of affection': grope, grub, give a tonsilectomy, and go for sushi.

In an allusion to a Hallmark Card commercial, the gift that keeps on giving is 'venereal disease'. A farewell currently in use even makes light of childbirth: make like a baby and head out.

The apparent callousness of some college slang is more a device of self-protection against not fitting in than a real objection to the social norm. College slang provides its users with automatic linguistic responses to handle awkward social situations with peers. The humor of college slang is important in this regard. Referring to sexaul intercourse flippantly as parallel parking allows the speaker at least publicly to minimize the emotional commitment involved in the action. The large set of affirmative and negative evaluative terms available at any time in college slang (like yernt, dweeb, geek, wastecase, wimp, nerd, elrod, goober, wuss, and zero now popular) allows users to appear to make value judgments without really taking a stand or exposing their feelings. A college woman who says that she has been latered by her high school sweetheart gives the appearance of taking the rejection lightly, though the breaking of the relationship may actually be quite painful. Likewise, picturing the attractiveness of a female in fast-food terms like burger, double burger, and triple burger with cheese allows a male speaker the anonymity and lack of inter-personal involvement associated with eating at such establishments.

Since medieval times students have developed vocabularies that picture themselves on the outs with the establishment and ally themselves with less respectable elements of society. They have always borrowed from the language of subcultures. Today's American college slang borrows heavily from the language of Blacks, current examples including bro, homeboy, mainsqueeze, and what it is. However, compared with groups that develop anti-languages, college students are in a unique relationship to the establishment. First, they conduct their business of being students in the standard language. Indeed, they are required to demonstrate some proficiency in the standard written language for admission to the group. Second, their group membership is temporary, for their goal is to relinquish their status as students in four years. Other considerations include their youth, their development of financial and psychological independence, and their aspirations for the future. Although their slang may provide them with a means of subtle rebellion against all these pressures, it mainly provides them with a means of feeling connected to other people subject to the same insecurities.

Although this paper draws examples from students at one southern, state university, slang probably serves students at other colleges in similar ways. College slang is not a full-fledged antilanguage. The opposition to authority is rather playful and in predictable areas, obligatory and automatic rather than heartfelt--basically serving as another way for college students to acknowledge their common plight.

*Bernstein's 1959 article "A public language: some sociological implications of a linguistic form," British Journal

of Sociology 10, 311-26, is also helpful. Although Bernstein soon gave up the orderly lists of distinctions between public and formal languages, he explains in the introduction to Class, Codes and Controls (1971) that "for me they were critical focusing points in order to explore an intution." They are still useful to others for the same reason.

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MORPHOLOGICAL EXPLANATIONS OF CHICANO WRITING NEEDS

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Far more is currently known about the features of other minority dialects than is known about Chicano English, although Chicanos are the second largest minority in the U.S. The Mexican American population has effected a near doubling in the last decade, growing from 4.5 million in 1970 to 8.7 million in 1980. Furthermore, with second and third generations, there is "evidence of increasing likelihood of English as a first language" (Amastae 1981). Unfortunately, despite the dramatic increase in number of speakers, this language variety is only beginning to be documented. Partially, this situation is due to the complexity of the continuum of its speakers. For purposes here, we will follow Baugh (1981) and refer to Chicano English as "any variety of English spoken by a Chicano who can conduct conversation in English exclusively." For a history of the study of CE as a separate dialect, see Ornstein-Galicia (1981).

The premise of this paper is that Chicano English is a rule-governed linguistic system developed within the socialization network of Mexican Americans. As dialectologists have long maintained, people learn to speak like the salient people with whom they are most frequently in contact. Previously, researchers attempted to establish the role of interference from Spanish in the formation of Chicano English. Data from this study, however, support the general conclusion of Gonzales (1981) and others that Spanish is only a relatively minor cause of differences. Rather, we claim that deviations from the standard are due to overgeneralization and developmental and dialectal sources. It is likely that "stages in the acquisition of English have become norms of English for some segments of the Mexican American population" (Wald, 1981).

The hypothesis to be investigated in the current study of college English writing samples of Mexican Americans is that, contrary to the claims of Amastae (1981) that "writing errors of Hispanic students are hardly unique," that Chicano English writing differs in a systematic way from standard written English. Our claim is that writing errors seen in 110 compositions of 25 Mexican American college students differ linguistically in quality and extent from the errors displayed by non-speakers of CE. This position is counter to Amastae's statement that "for the most part Spanish-speaking students make the same errors English-speaking students make" (Amastae 1981).

The focus of this paper is on the systematic variation in one major category of distinctive errors: morphological errors.

Six types of morphological errors will be exemplified and explanations for their occurrence will be given which reveal that the errors are more predictable and systematic than has previously been acknowledged. These error types are shown in (1)).

(1) Morphological Mistakes in the Writing of Chicano College Students by Type

1) Level Ordering Violations
2) Zero Morpheme/Conversion Overgeneralization
3) Analogy Without Principle of Conventionality
4) Confusion About Denominal Verbs from Spirant Voicing
5) Overextension of Morphological Haplology
6) Stress Shift Conversion Confusion

In seeking to understand the cause of the principle divergence in Chicano writing, the notion of "dialect influence" described by Whiteman (1981) is helpful. "Dialect influence" refers to the use in writing of nonstandard features which are traceable to the oral language competence of the writer. The term is more appropriate than "language interference" for this group.

By detailing the features determined by linguistic analysis to be the major problems, we hope to encourage the recognition by teachers of the possibly predictable mistakes, for only with full realization of dialectal differences, their scope and cause, can teachers be equipped to effectively design programs for teaching composition. We concur on this point with Reed's (1981) statement that

> The college English teacher...cannot afford to persist in the general lack of awareness about the student's dialect, itself a full-blown, rule-governed linguistic system, which is different enough from Standard English to comprise a significant interference factor blocking the student's ability to acquire standard English writing skills.

We maintain that it is not enough to know that there are differences, but that it is essential to know what those differences are. It is apparent that linguistic descriptions of minority dialects have proven helpful to educators in so far as they specify the exact nature of the differences. Only then can effective teaching materials be created. The current study is aimed at providing a detailed look at these discrepant areas for the strong reason that students want to eliminate stigmatized patterns from their writing.

Data Collection and Analysis

In order to collect a sufficient corpus to analyze, compositions were collected from 25 students, all of whom were Mexican American college freshmen at a major university in Texas enrolled in one of two writing classes along with Standard English speakers. Each student sampled possessed a high degree of proficiency in English, both spoken and written. Written consent

was obtained. The students varied along the continuum described by Baugh (1981). Some were monolingual English speakers, some were passively proficient in Spanish, and some were balanced bilinguals. None, of course, were monolingual in Spanish, and, crucially, none were learners of English as a foreign or second language. Therefore, the students in this study differ from open admissions students, recently immigrated students or speakers of English as a foreign language. Although there may indeed be similarities for other dialect groups, no claim is made that the analysis here is applicable to populations other than Mexican American speakers of Chicano English.

With 32% of the nation's Chicanos living in Texas, it is likely that the data is quite representative of Chicano English. For the study, 4 to 5 handwritten writing samples were collected from each student through the course of a semester, with the cooperation of the two instructors. The instructors were helpful in providing information. One of the students participated in a writing tutorial project of 8 sessions with the author.

The errors from 115 compositions were catalogued, recorded on 3 x 5 index cards along with the sentence in which they occurred. For the analysis, the categories were established when a sufficient number of recurrent errors formed a class. Initially there were 15 categories, but these were gradually collapsed into 3 major categories of errors: syntactic, morphological and pronunciation-based. Only the morphological errors will be discussed here, because they comprise the greatest proportion of errors, over 66 per cent.

The focus of the study is on morphological overgeneralization in light of the work by Baker (1979) and the question, "Why do learners overgeneralize?" In recording neologisms among Hungarian children, MacWhinney (1983) claims that there are at least 4 reasons why the 300 derivational neologisms his colleagues collected are not fully acceptable:

(2) i. they may use a stem which is either non-productive or idiosyncratic ('to make act like a pitcher' vs. pour)

ii. they may use an affix which is in arbitrary competition with another affix (examples from Stemberger 1982: decidal for decision, philosophist for philosopher, disparence for disparity)

iii. they may produce a result which is already present as a non-analyzed stem or idiosyncratic form (youth preempts youngness)

iv. they may fill a lexical gap which is of little importance to the adult world -- a perfectly good word that doesn't need to be encoded (Americanness; jet coaching)

Regarding 2ii, we can argue that one source of learner's unacceptable neologisms results, not from failure to select the arbitrarily determined correct affix, but from a violation of a more principled grammatical constraint. The key to comprehending this constraint and the resulting morphological errors we shall

examine lies in the theory of Lexical Phonology which is currently being worked out by Pesetsky, Mohanon, Kiparsky, Pulleyblank and Halle and Mohanon (1985). The main outlines of the theory are schematized in (3). With the principle of level ordering which the theory establishes, we can better see that many of the errors we will consider are simply the result of violations of level ordering of morphemes. We can note further that level ordering is developmentally acquired.

(3) EXAMPLES AND PROPERTIES OF LEVEL-ORDERED RULES

	Examples	Properties
Level 1	+ion, +ous, +ity, +th in+ , +al V→N (Ø) 'deverbal noun'	'Primary' Derivational affixes, irregular, idiosyncratic, host-deforming, stress shift, vowel reduction, ablaut, umlaut, etc. Unproductive
Level 2	#ness, #ism #hood, #er #ist, #dom, #ful #ship, #ment, #ly un#, #ed (adjecti-(val) Compounding N→V (Ø) 'denominal verb' +ing (nominal)	'Secondary' Derivational affixes, non-host-deforming, more predictable Productive
Level 3	#s, #ed, #ing	Regular Inflections, Non-Host Deforming, Predictable

Based on Kiparsky 1982

The 1982 account of Kiparsky's Theory of Level Ordering is a simple and coherent account of the implicit ordering of boundary types into primary or secondary or tertiary. Ordering, of course, is implicit in traditional phonology and accounts for why +ian (a primary affix) in Darwin +ian and #ism in Darwin #ism (a secondary affix) are both possible, as in Darwinianism, but that reversal of primary and secondary affixes, yeilding Darwin#ism+ian is not acceptable (Gordon 1984).

Briefly, in the schema above, Level 1 is considered to contain primary affixes (such as +ian, +ous, +al, +ion, etc), which typically "deform their hosts," changing them phonologically by stress shifting, vowel reduction, or alternation. Level 2, as shown above, contains secondary affixes, often called derivational morphology (such as #er, #ism, #ness), and is also the locus of compound formation. Words formed on this level tend not to alter the phonology. These affixes are more productive and can be used relatively freely. Level 3 contains all the regular inflectional morphology (#s, #ed, #ing). These affixes are

semantically predictable and do not deform the host by changing pronunciation. They can be added after either Level 1 or Level 2.

The main tenet of level ordering, a crucial matter to observe, is that rule application proceeds through these three levels in an orderly fashion, 1→2→3. Rules at a later level may not be applied prior to rules applied at a previous level. This means no backtracking. Once the chance for affixation at Level 1 is used up or ignored, the derivation proceeds through Level 2, which can also be utilized or disregarded, but the output may not return to Level 1 once Level 2 has been entered. Passage to Level 3 and use of affixation available there, likewise, prevent subsequent affixation.

The immediate consequence of positing these ordered strata or levels of morphological affixation is that, although class 2 affixes can be attached to stems containing either class 1 or class 2 affixes, class 1 affixes cannot be attached to stems already containing affixes of class 2. This constraint will have some interesting ramifications for our students.

To exemplify the ordering, both the words grammaticality and grammaticalness are well-formed, as predicted by the levels, but only guardedness and not *guardedity is well-formed, because the level 2 suffix, adjectival -ed, cannot be followed by the Level 1 suffix, +ity, as Halle and Mohanon (1985) illustrate. Likewise, if we consider the unacceptable word *helpfulity, we find that #ful is a Level 2 affix and cannot precede affixation of +ity, a Level 1 affix. Undoubtedly, these sequences, while well-principled, are difficult to follow. How, then, is a language learner to determine which level particular affixes should be assigned to?

It is possible that symptomatic properties (for example, pronunciation changing or 'host deforming' as in sane--sanity might guide a learner to decide on level assignment. Crucially involved, too, is the distinction between derivational and inflectional affixes. We hypothesize that errors of level ordering may be a principle factor in the morphological mistakes which are notable in the writing of Chicano English speakers.

A related problematic area for language learners involves the bracket erasure convention (BEC) (Halle and Mohanon 1985), which states that at the end of a level, the brackets delimiting the constituents of the word are erased, and the speaker no longer has access to the enclosed information. Consider the student error shown in (4), which involves the Level 1 affix +al:

(4) The question of whether to raise the drinking age to twenty-one is the argumental issue.

This incorrect application may be seen in terms of the student's having applied a Level 1 affix after a Level 2 affix, which is not permissible. This violation of level ordering, or backtracking, is illustrated in (5). Note that this error, like others, may be based on overgeneralization, because English does contain words like sacramental and ornamental, as shown in (6). However, the notion of bracket erasure, whereby in passing to the next level a language user loses information about previous steps or processes, may also account for this phenomenon.

```
(5)  Level 1                          Level 1  -
          [sacrament] [al]
               +latinate              Level 2 [argue] [ment]
          [[sacrament] [al]]                   [[argue] [ment]]
          [sacramental]                        [argument]    BEC
     Level 2  -                       Level 3  -
     Level 3  -                       output  [argument]
     output [sacramental]             X ----------------------
                                      Level 1 [argument] [al]
                                              [[argument] [al]]
                                             *[argumental]
```

```
(6a) sacrament    +al →sacramental
     ornament     +al →ornamental
(6b) adornment    +al →*adornmental
     enhancement  +al →*enhancemental
```

Observe that, in (6a), sacrament and ornament are different from (6b) adornment and enhancement in an important way. The latter are formed from verbs and do not permit additional affixation of +al at Level 1 after Level 2 affix ment so *adornmental and *enhancemental are starred as unacceptable.

On the other hand, the words sacrament and ornament are formed from bound latinate stems, sacra and orna. In many cases, learners may not have access to this information. This supports the developmental aspect of the formation of the Chicano English dialect. In the social milieu, the speakers learned the dialect from someone who either spoke Spanish, or had learned his dialect from someone else who spoke Spanish.

The sentence in (7) illustrates yet another violation of sequencing.

(7) The presence of so many undocumental workers remains a serious problem.

Still other morphological errors indicate non-awareness of the syntactic categories which can receive an affix. The example in (8) illustrates this problem.

(8) Independent of their competence, there is the further complexing factor of the use of special vocabulary.

In addition, level ordering may explain why so-called competing agentive suffixes, as studied by Clark and Berman (1984), are not really in direct competition but are selected according to the constraints of level ordering. One writer in the sample coined "demographist" and Stemberg (1982) cites a similar error, "philosophist." Because compounding is ordered on Level 2 in Kiparsky's theory (1982), the word formation process cannot double back to Level 1 once Level 1 is passed and Level 2 has been utilized. The barred derivations in (9) show this.

Likewise, the combination philo +soph occurs on Level 2, so it is not possible to return to Level 1 for attachment of +ist. Speakers of English must use the Level 2 affix, #er for philosopher. Compare this with the word sophist, which is acceptable since Level 2 compounding has not been passed. Because of bracket

erasure, learners may not be aware of the compounds, or how the input was constructed.

```
(9)  Level 1  -                  +ist
     Level 2 [demo]       +[graph]  ↑
             [[demo]       [graph]]  ⋮
             [demograph]   ........X
     Level 3 [demograph]+  [er]
             [[demograph]  [er]]
             [demographer]
```

What falls out from these principled level orderings is the fact that we can predict what will be a well-formed derivation in the language and that learners - whether they be child, bilingual, or bidialectal, must learn these orderings. All languages have levels, it appears, although the number differs, and of course the items included in a level differ cross-linguistically. This is a source of difficulty. Affixes must be learned according to their levels.

Clark and Berman's study (1984) of children and adults' preference in the three agentive suffixes, -ist, -er, -ian, showed that -er was favored for its transparency and formal simplicity. Their finding is consistent with the argument that it may be preferred because there are fewer constraints on level ordering for it. We can predict that compound nouns of the form in (10), since they are derived on Level 2, must have Level 2 agentive suffix, as in (11), however, if Level 2 has not been utilized, a Level 1 affix may be followed by a Level 1 affix. Thus we get (12), <u>industrialist</u>.

```
(10) blackmail, stargaze, tailgate
(11)  blackmailer      *blackmailist
      stargazer        *stargazist
      tailgater        *tailgatist
(12)  industry
      industrI +al +ist
```

We turn attention now to a second problem of morphology, the problem of how the learner discovers zero morphemes, given that there is no acoustic cue (Pinker 1985). Slobin (1979) and Clark and Berman (1984) also disscuss conversion. In conversion, word class membership is defined syntactically rather than by morphological shape. This automatically makes words with zero morpheme less transparent and less easily learnable. English contains a number of these conversions, as shown in (13) Often a noun becomes a verb or vice-versa, with no change in affixation or pronunciation.

```
(13)     V→N                  N→V
       doubt→doubt          bottle→to bottle
       love →love           corner→to corner
       laugh→laugh          coat  →to coat
       walk →walk           mask  →to mask
       catch→catch          peel  →to peel
       cheat→cheat          knife →to knife
```

As common as these conversions are, their application is not across-the-board. They appear to be limited to single syllable or 2-syllable words with stress on the first syllable. Non-awareness of the restrictions on freedom of application may have caused the student error in (14)

(14) His involve in organized activities for the younger generation has kept him constantly working with, teaching and exchanging ideas with the teenagers of today.

Another conversion process also appears to be overgeneralized by Chicanos. Whereas English allows adjective-to-verb conversions as in tan→to tan, it does not allow many adjective-to-noun conversions as a productive process. Spanish does. Chicano English speakers employ the extremely limited adjective-to-noun conversion process too liberally, as seen in the examples in (15).

(15) Educated run high offices and other major positions in their community.

Yet the role of religious in my life has not been very great.

Hey, pretty, come on over and sit down, he yelled.

The use in English is limited to high frequency noun phrases, such as young marrieds and comic.

It is apparent that these overgeneralizations are the result of the learner's not yet hypothesizing the necessary constraint. Speakers of this dialect do have conversion in the range of word formation devices, but how can learners discover the correct range of application of lexical rules?

The errors observed here are consistent with MacWhinney's observation that segmentable morphemes are easier to learn than zero-marking. Learners are in fact good at segmentation, less good at conversion. The writers here employ all three of the basic categories of word formation: rote, combination and analogy. This is in contrast to the at present conjectural statement by Vihman (1982) indicating that bilingualism is a factor in morphological delay. This claim in not endorsed, but is worthy of consideration. Vihman (1982) attempts to establish the validity of a whole-word approach to morphology by the bilingual child. She claims that a child who must deal with two languages from the start may avoid inflectional markers in preference for word-sized morphemes. She maintains that a resulting delay in word-combining skills, or the ability to decompose complex words, is traceable to the special cognitive task imposed by bilingualism. What appears more likely, however, especially since her conclusions are based on data from a single English-Estonian bilingual child, is that the whole-word approach to morphology is simply one of various cognitive styles, or even one phase in the approach to the acquisition of word combining skills. A growing body of research supports the notion that bilingualism is cognitively enriching rather than diminishing.

We next examine the third morphological problem for Chicano English writers: the overuse of the process of analogy as a strategy in word formation. We have ample evidence that CE dialect speakers rely extensively on this technique. The writer of (16) may have seen her formation, paralization, as analogous

to the morphological compenents of industrialization.

(16) Physically, they either die, are maimed or suffer paralization.

The writer, however, has failed to observe the Principle of Conventionality, discussed by Clark and Berman (1984). Basically, where two or more plausible word formations exist, the one conventionally used has preference. The other form must be discarded. Learners have to observe the idiosyncracies of the well-established lexicon (eg., we speak of hunger, not hungriness; promptness, not promptitude). Kiparsky (1983) states that standard speakers avoid synonomy when two synonyms derive from the same stem. This explains why paralization and paralysis do not coexist in the standard lexicon, although both are well-formed.

The fourth type of problem is illustrated in (17).

(17) I especially admire my mother because despite hardships she has encountered she has remained steadfast in her believes.

When questioned about her word choice, the student said that she knew leaf/leaves and assumed the plural of belief was formed in a similar way.

This problem is closely related to an additional phenomenon for which phonological interference from Spanish has been claimed by Penfield (1981) and Herrick (1981). We will argue here that an alternative explanation is more likely and that errors such as in (18) are in essence morphological mistakes.

(18) He could easily safe us.
No one has been able to proof God's existence.
He has given me advise on what college life is like.
There are many things in this world that people strongly belief or disbelief.
They are taught to live and breath basketball or baseball, or whatever sport they happen to play.

It simply appears that student writers are not aware of the regular but limited morphophonological process of English whereby a noun becomes a verb by voicing of spirants. The rule they have not acquired is similar to that in (19) and illustrated in (20).

(19) $\begin{Bmatrix} f \\ s \\ \theta \end{Bmatrix} \begin{matrix} \rightarrow \\ \rightarrow \\ \rightarrow \end{matrix} \begin{Bmatrix} v \\ z \\ \eth \end{Bmatrix}$

N⟶V

(20)

Noun		Verb	
safe	[sef]	save	[sev]
thief	[θif]	thieve	[θiv]
advice	[ædvays]	advise	[ædvayz]
house	[haws]	house	[hawz]
bath	[bæθ]	bathe	[beð]
sheath	[šiθ]	sheathe	[ši ð]

We turn attention now to the fifth problem, involving a phenomenon which has been at the center of a widespread misconception about the emerging dialect of Chicano English. Because the major advances in dialectal studies of nonstandard languages have dealt with black English (Labov 1966), it may be natural to assume that speakers of all non-standard dialects share the same errors. One well-known feature of BEV is copula deletion. There is a widespread notion that CE speakers and writers also omit

the inflectional marker /s/ for third person singular and the possessive.

A careful analysis of student errors such as in (21) yielded almost no instances of these mistakes. Consistently, Chicano writers did mark possessive /s/ and third person /s/ on verbs. However, they failed to mark plural nouns with /s/ and close observation of the phonological environment where this occurs prompts the generalization that omission of plural /s/ marker occurs only with plural nouns and only when a sibilant, /s/ or /š/, precedes. The rule accounting for sentences such as in (21) is shown in (22).

(21) I'm sure glad that my father was one of the biggest influence on my life.
The factors are what make up the differences and likeness of people.
It is unfortunate that these blemish are everywhere evident.
These subareas persist or even grow since they continue to experience influx of people.
I'm reasonable confident that they gave honest response to our inquiries.
The strengths and weakness of this measure have been extensively discussed.
In the past the chief source of energy were the fossil fuels, coal, oil and natural gas.

(22) $[\partial z] \rightarrow \emptyset \,/\, \begin{Bmatrix} s \\ \check{s} \end{Bmatrix}$ ____
Plural Noun

We see then that contrary to misconceptions, the tendency to omit /s/ is not general in Chicano English writing. Omission of /s/ is limited to plural nouns which end in a sibilant. Recent work by Stemberger (1981) on morphological haplology and Menn and MacWhinney (1984) on the repeated morph constraint shed a great deal of light on the absence of /s/ for plural nouns ending in /s/ or /š/. Languages use various strategies to avoid the "accidental" repetition of identical or nearly identical surface morphs. Haplology is a favored strategy. Indeed, Berko (1958) observed the late appearance of regular plural marking on nonsense words like niz and tass and suggested that /s/ was omitted because the stems already sounded like plurals to children. In English, possessive plurals (e.g., the boys' bikes) show obligatory haplology, and the plural is zero-marked for some Latin words, like species. The students sampled may have noted these regularities and overgeneralized them.

One final case of morphological regularities which have been imperfectly perceived is a type not previously cited in the literature on Chicano writing. This type is illustrated in (23).

(23) Rates have certainly doubled since the AT&T break up.
My father was born a poor Hispanic child in the run down part of San Antonio.
These create obstacles to political and social action that might breakdown the barriers.

These morphological errors are called two word/one word in the coding process. They are manifested in spelling violations. The process writers seem not to control is the formation of a noun or adjective from a verb and a particle, with the noun or adjective written as one word. These stress shift conversions are increasing in frequency in English, expanding at a rate similar to diatones, the process where part of speech is signalled by a stress shift, but no affixation. Sample forms are seen in (24) and (25).

(24)

Verb + Particle	→	Noun
take + over		takeover
pin + up		pinup
rub + down		rubdown
wind + up		windup

(25)

N	V
conflict	conflict
affix	affix
abstract	abstract
suspect	suspect

In summary, we have examined the six areas of morphological problems in language development of Chicanos. Each of the mistakes by the writers involves the productivity paradox of Baker (1979). The data indicate that the writers possess a large lexicon, a repertoire of word formation devices, but crucially have not learned or hypothesized the necessary constraints which apply. These constraints on word formation range from semantic to phonological. A rule may apply only to monosyllables, only to native roots, only to Latinate roots, etc. That is, each of the cases of ungrammatical lexical items is created by the overapplication of undifferentiated productive rules. One danger for the writers that results is that "speakers may store their own new combinations in the lexicon" (Menn and MacWhinney 1984). After producing it, a person may acquire it.

A second danger arises for the students studied because of the practice of holistic grading. The overall impression of composition teachers is lowered by even one or two spelling and grammatical mistakes, according to a study by Robinson (1985). Compositions with lexical mistakes are given lower grades despite content or organization. The problem is compounded for CE speakers because dialectal and developmental forces may not serve to provide the necessary negative evidence. We can ask, in the absence of overt negative evidence or with vague comments from graders such as "awkward diction," how can learners eliminate incorrect lexical entries. The problem touches at the core of the practical dilemma for teachers and speakers of all nonstandard dialects. Pinker (1985) posits two mechanisms to counter such morphological mistakes: 1) retroactive constraint enforcement, and 2) suppletion by independent forms. Basically, the learner can learn either the constraints or the idiosyncratic form and force the old entry out. Because the subjects involved here are not children, who could be expected to develop this knowledge over time, but are young adults who are being judged on writing ability, their need is immediate. We believe that when teachers become aware of the extent and nature of morphological mistakes, they can offer overt instruction to adults. Effectively, they can teach the constraints rather than

correcting case by case.

By identifying the range of the problem, this paper is a preliminary step to providing the type of assistance which will address the writing needs of Chicano students. We have attempted here, on the basis of a limited sample of compositions by 25 Chicanos, to identify and illustrate the six particular areas where Chicano English writers differ from other writers of Standard English. We cannot conclude that they make the same errors standard English speakers make in writing. Our claim is that the types of errors explored here have a systematic explanation and involve overgeneralization and stem from developmental and dialectal sources. These errors differ both from the types of mistakes ESL learners make and from those of standard speakers. The claim bears further study with a broader sample and additional tools of observation. With further research we may be able to resolve the learnability issue and the theoretical question of productivity beyond input.

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ON COMPOUNDING IN BRAZILIAN AND SPANISH AMERICAN RACIAL CATEGORIES

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0. Introduction.

The racial terminology of any society creates and reinforces the attitudes people hold toward one another. Although the term 'race' in Spanish America and Brazil encompasses not only physical traits but often also social class, ethnic group, and religion, racial categories are generally based on such physical characteristics, or phenotypic traits, as skin color (Spanish blanco, negro, rosado, moreno or Portuguese amarelo, branco, preto), nose type (Spanish picota, ñato), eye color (Spanish zarco), hair color or quality (Portuguese louro or Spanish pelo malo), or lip shape (Spanish bembón, bembudo), which allow the identifier to make a subjective judgment. Often these modifiers are appended to another descriptor and thus change the meaning of the identification in some manner, e.g., Spanish blanco or moreno vs. blanco moreno and chino or grifo vs. chino grifo, and Portuguese moreno or alvo vs. moreno alvo.

Since interracial relations and racial patterns fluctuate greatly in Latin America, multiple or compounded terminology can serve to change one's own social status or race, or to malign or speak well of another person by means of purposeful ambiguity on the part of the speaker (Solaún and Kronus 1973:passim). There are instances, therefore, in which racial types are further explained by the juxtaposition of another metaphorical descriptor, which itself is quite often used alone as a racial category. Many of these compounds have existed in Latin America since the earliest contacts of peoples from Europe, Africa, Asia, and America. Examples from Spanish America incluce chino cholo, mulato morisco, mestizo blanco, abejón colorado, blanco rosado, mulato criollo, bozal torpe, indio alobado, chino prieto, and chino puro. From Brazil we find preto mestiço, mulato bem claro, negro-aço, mulegue pardo, and escravo preto cativo. (See Appendix for definitions of each paratactic compound.)

This juxtaposition, called parataxis, (Preminger et al. 1974:491) is a type of metaphor which occurs regularly in modern European languages. Consider the examples from Manuel Puig's novel, El beso de la mujer araña 'Kiss of the Spider Woman' or the English term sun-god. Both lexemes of the compounds mujer araña and sun-god combine to form another unit of meaning. These paratactic compounds occur throughout the racial classificatory systems found in Brazil and Spanish America and solve one of the problems of overburdened unitary lexemes that result from the vast extent of racial mixing in Latin America.

2.0 Types of paratactic compounds.

A paratactic compound may assume several forms, either noun plus adjective, adjective plus adjective, or noun plus noun, depending on how each lexeme is viewed. For example, in Spanish American and Brazilian classification, one could look to ordinary color terms, which also distinguish racial categories. Within the racial classificatory systems, color terms modify other nouns as adjectives (Spanish español blanco, abejón colorado, indio blanco, tercerón negro and Portuguese mulato branco, sarará preto), they restrict each other (Spanish blanco rosado and Portuguese branco amarelo), or other adjectives modify them (Spanish negro congo, moreno trigueño and Portuguese preto claro, branco mestiço.

In this way, the nineteenth-century Cuban Spanish category chino manila juxtaposes chino 'Chinese' and Manila, the name of the Philippine capital. This compound created a completely new racial category with special semantic overtones, namely, 'Asiatic slave' and thus avoided confusion with chino 'offspring of a black and a mulatto'. In this example, as in many others, the two parts do not equal the whole.

2.1 The purpose of paratactic compounds in the systems.

Compound racial lexemes serve several purposes, the most important of which are clarification, ambiguity, pejoration, and euphemism. The simple lexeme negro, for example, indicates the black or dark skin color of the referent, whereas the compound negro bembón highlights the large lips of this person, often purposeful pejoration on the part of the user. On the other hand, negro ladino 'an

assimilated black person' is rather a euphemism in which ladino means that the person can speak Spanish or Portuguese.

In other cases, the compounded terms ambiguate rather than clarify the semantic function in the racial nomenclature system. For example, the polysemous lexeme indio is frequently used with cultural as well as biological connotations (Gibson 1966:117); that is to say, Spanish indio can indicate the social status or the physical type of the person. This stands in contrast to indio alobado 'offspring of a mulato alobado and an Indian, thus a person possessing few Negroid features' (Woodbridge 1948:348; Aguirre Beltrán 1972:170). This category functions almost solely as a marker for phenotype, and as is the case with many other paratactic compounds, fills a gap in the classificatory system.

2.2 Analysis of the systems.

The consideration of racial terminology as a semantic field makes it possible to show the complex interdependence of the lexical systems. (Bynon 1977:105). Since racial classifications of Latin America can be characterized by continuous and rampant overlap of terminology, a brief study of this interdependence is paramount to the understanding of the systems, especially in view of geographical and temporal bounds.

Racial categories, like kinship terminology and colors, are a semantic field which also fall into the grouping of folk taxonomies. These folk taxonomies, or systems of folk labels, consist of three types, here exemplified with Spanish American and Brazilian racial categories:

1) unitary simple, e.g., Portuguese branco, crioulo, babeco;

2) unitary complex, e.g., Spanish tentenelaire, saltatrás, blanconazo, tornatrás; and

3) composite or periphrastic, e.g., Spanish mulato blanco, saltatrás cuarterón, mulato pardo, Portuguese caboclo cabelo de flecha.

Clearly racial compounds would be considered composite in the Conklin (1962:128) explanation. The interesting aspect is that these compounds have allowed for efficient semantic expansion of the racial classification systems, which was accomplished by integrating in an economical fashion terms that combine unitary simple and unitary complex lexemes.

2.3 Terminological overlap: Polysemy and synonymy.

Polysemous terms and synonyms are abundant in Spanish American and Brazilian racial taxonomies. For example, Spanish moreno has at least ten different meanings including 'a black person', 'a mulatto', 'a brunette', and 'a mestizo', each depending on the region and time of use. In contrast, pardo, mestizo, mulato, moreno, among others, can be synonyms but do not generally share the same geographical or perhaps even temporal range.

Furthermore, the gross lexical and semantic overlap in racial categories has created the illusion of an asystematic conglomeration of terms. Mellafe (1975:112), however, has noted that, during the eighteenth century, racial terms had similar meanings with only minor regional variation but that very complex racial categories were already in place. The early Latin American systems thus resorted to compounding in order to clarify confusing racial names. Some examples include castizo cuatralbo in colonial Mexico, zambo retorno in colonial Spanish America, branco misturado in late eighteenth-century Brazil, and mulegue pardo in colonial Brazil.

Synonymous racial items relate with polysemous ones in several ways: 1) they can ambiguate the social and racial realities; 2) they may euphemise a derogatory term; 3) they can be used as purposeful insults; and 4) they aid in avoiding the use of terms with multiple meanings. That is, a blanco and a mulata might produce a child who could be tercerón, cuarterón, or mulato morisco, depending on the location and the circumstances. So many synonyms and polysemes in a sense require the use of juxtaposed descriptors in an attempt to clarify the situation. Without paratactic compounds, the unitary racial categories could and would be rendered incomprehensible in many cases.

3.0 Conclusions.

Paratactic compound terms indicating race suggest that a simple unitary or complex lexeme has not been sufficient to handle the expansion of the semantic field as a result of social, historical, and linguistic factors. Linguistic changes in the semantic range reflect the conditions prevalent in societies in which racial mixing is prevalent and racial ambiguity often willful. Purposeful ambiguity allows for 'passing' into a different and more socially acceptable class. As Ullmann (1962:227) has

suggested, the range determines the evaluative power of a reference, be it ameliorative, pejorative, or ambiguous.

Moreover, both the blurring of racial lines caused by racial mixing and the concomitant confusion of terminological categories generally function to dissolve some racial prejudice (McAlister 1963:366-8; Solaún and Kronus 1973:52; Harris 1970:12). That is to say, the realities articulated through the vocabulary reflect a basic precept of a complex society which is conscious of a person's race and social status but which also foments upward social, and even racial, mobility. A modified racial category can be euphemistic when used in self-reference by a person who is 'non-elite' or derogatory when one wishes to denigrate another person.

The fluctuation of interracial relations and racial patterns will continue to force the realignment of the ethnolinguistic naming system of Latin American racial terminology. One could expect that the nomenclature system will become less expansive in some areas and more so in others as a result of social change. Clearly, paratactic racial compounds are kinds of circumlocutions or paraphrases which can have various meanings depending on the context.

Appendix

Definitions of some Racial Compounds from Brazil and Spanish America

abejón colorado
'a mulatto with kinky reddish hair'
Dominican Republic; mid-twentieth century

blanco moreno
'a browned-skinned or dark-skinned white'
Colombia; twentieth century

blanco rosado
'a white person with pinkish skin'
Colombia; twentieth century

bozal torpe
'a black slave who spoke Spanish imperfectly or not at all'

Mexico, Peru, Cuba; colonial
branco amarelo
'a yellow-skinned white person'
Brazil; twentieth century
branco mestiço
'a mixed white person'
Brazil; twentieth century
branco misturado
'a mixed-blood white person'
Brazil-Sergipe; late eighteenth-early nineteenth centuries
caboclo cabelo de flecha
'a caboclo with arrow-straight hair'
Brazil-Bahia; twentieth century
castizo cuatralbo
'the offspring of a mestizo and a white'
Mexico; colonial
chino cholo
'the offspring of a black and an Indian'
Peru; colonial
chino grifo
'the offspring of a mulatto and an Indian'
Mexico; eighteenth century
chino manila
'an Asiatic slave'
Cuba; nineteenth century
chino prieto
'the dark-skinned offspring of a white and an Indian'
Peru; colonial
chino puro
'a Chinese person'
Colombia; twentieth century
criollo mestizo
'the offspring of a white and a mestizo'
Peru; twentieth century
cuarterón cuatralbo
'the offspring of a white and a mulatto'
Mexico; colonial
escravo preto cativo
'a black captive slave'
Brazil; sixteenth-seventeenth centuries
español blanco
'a white, usually born in Spain'
Spanish America; colonial
gente bien
'a white person, usually of the upper class'
Colombia; mid-twentieth century
indio alobado
'the offspring of a mulato alobado and an Indian, who looked more Indian than black'

Mexico; colonial

indio blanco
'an Indian, known for his near-white skin, from a tribe of the Upper Orinoco area'
northern South America; mid-twentieth century

indio gringo
'a fair-skinned Indian'; social marker
Peru; twentieth century

indio picota
'an Indian chief, or cacique'
Peru; colonial

mestizo blanco
'the offspring of a white and an Indian'
Mexico; colonial

moreno alvo
'a white brunette or brown-skinned person'
Brazil-Bahia; twentieth century

moreno criollo
'a black person born in Puerto Rico'
Puerto Rico; late eighteenth century

mulato alobado
'the offspring of a mulato lobo and an Indian who has non-Negroid features'
Mexico; colonial

mulato bem claro
'a very light-skinned mulatto'
Brazil; twenthieth century

mulato blanco
'the offspring of a white and a black'
Mexico; colonial

mulato branco
'a light-skinned mulatto'
Brazil; twentieth century

mulato criollo
'a native-born mulatto'
South America-northern; seventeenth century

mulato morisco
'the offspring of a mulato blanco and a white'
Mexico; colonial

mulato pardo
'the offspring of a black and an Indian'
Mexico; colonial

muleque pardo
'a young dark-skinned black slave'
Brazil; colonial

negro-aço
'an albino'
Brazil; twentieth century

negro atezado
'a black person, usually a slave born in Africa, with very dark skin'

Spanish America; colonial
negro bembón
Spanish America; twentieth century
negro cafre de pasa
'a black from the east coast of Africa'
Mexico; colonial
negro congo
'a black African, usually a slave, or any black who is very dark-skinned'
Puerto Rico; colonial
negro criollo
'a black, generally a slave, born in the New World'
Mexico, Spanish America; eighteenth-nineteenth centuries
negro jetón
'a black person with very thick lips'
Bolivia; twentieth century
negro ladino
'a black slave who could speak Spanish and was partially assimilated to Hispanic culture'
Spanish America; colonial
negro prieto
'a black person with very dark skin'
Puerto Rico; colonial
preto claro
'a light-skinned black person'
Brazil; twentieth century
preto mestiço
'a mixed black person, probably one with not so dark skin'
Brazil; twentieth century
saltatrás cuarterón
'the offspring of a black and a <u>tercerón</u>'
Mexico; colonial
saltatrás quinterón
'the offspring of a black and a quadroon'
Mexico; colonial
sarará preto
'a dark mulatto'
Brazil-Bahia; twentieth century
tercerón cuatralbo
'the offspring of a white and a mulatto'
Mexico; colonial
tercerón negro
'the offspring of a white and a black, whose features are more white than black'
Spanish America; colonial
trigueño piel canela
'a mulatto, euphemistically'
Puerto Rico; twentieth century

vecino ladino
'a mestizo'
Central America; late eighteenth century
zambo mosquito
'the offspring of a black worker from the English Antilles and a native woman from the eastern Central American coast'
Honduras, Nicaragua, Central America; colonial
zambo retorno
'the offspring of a black and a mulatto'
Spanish America, Brazil; colonial

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A COGNITIVE BASIS OF METAPHOR

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The fetal heart, when it is barely more than a muscular tube, begins to beat and from then on assumes its central role in the body's circulation, pumping away all the while that it is itself in the process of formation, growing into the complicated 4-chambered organ that will serve us the rest of our lives. Our language, like the heart, works for us from the most embryonic stages, growing and changing all the while that it is being elaborated without, so to speak, ever missing a beat.In computers, they call it "bootstrapping." A relatively simple start-up system is put in place. It can handle the simplest tasks for which it was designed as well as construct the modules which take it to the next level of development where it repeats the process, and so on.

This, I propose, is the model for the growth of our system of reference. I started out trying to explicate the cognitive basis of metaphor and have come to regard metaphor as the cognitive base upon which our system of reference develops. Metaphor, (loosely speaking), is the initial process: it gets us talking and calling things by name, but the entry requirement is not too high. The names do not have to be too stable or too "accurate." Since metaphor is also part of the mature system, these namings are interpretable, roughly, by those around us and in any event, they are deeply embedded in structured contexts so their information content need not be very great. Step 2: The requirement for stability grows as we expand the numbers of "words" and move away from the restricting initial contexts. By now the memory capability is expanded, is becoming more organized and hence able to handle more data. Closer grained distinctions are possible where experience has built up knowledge representations modeled after those of our mentors. We are still limited in not having a label for everything in our world and so we sometimes have to stretch existing labels to cover new situations. With a growing "history" we are much more aware of what is new material: we are constantly checking for similarities and differences. Metaphor is always an option, and we continue to exercise it. Step 3: The world of words moves into our consciousness in its own right. An element of judgment enters, a by-product perhaps of other psychological growth. We do things with words, more or less successfully. Lack of success in particular brings our attention gradually to the form of an utterance as distinct from its content. The words themselves become accessible as objects of analysis, disembedded from our sentences and their contexts, where meanwhile they continue to function automatically, below conscious control. Awareness of conventions in the larger culture means we seek greater conformity with them. Step 4: We become aware that metaphor is also one of the conventions of the larger culture. We are in a position to be more sensitive to the factors in language and customs that signal metaphoric use and interpretation. At this level, we are less dependent on symbolic play contexts to give meaning to our figurative utterances and can use the resources of the language and language use customs to establish the coordinates hearers will use to interpret our discourse.

What we have is a dialectic of linguistic invention (step 1) and convention (step 2). The cognitive dimension of awareness (step 3) mediates a synthesis (step 4). To

support this view, we must show

1) the contributions of referential invention and convention to word meaning in the mature system;

2) the course of referential development including metaphorical usages;

3) the developmental course of metalinguistic awareness, showing at least its coexistence with the phenomena in question as a necessary condition for

4) the influence metalinguistic awareness exerts on our system of reference.

This paper is organized in parts corresponding to 1), 2) and 3) above; #4) is the goal of an experiment that is proposed in the final section.

The general mechanism of the metaphor is to transfer some characteristics of one term to the description of a second term with which those characteristics are not generally associated. A synechdoche (the "sails" in the harbor, for the boats) uses the part for the whole; a metonymy effects a more general substitution, the actor for the action or product, the container for the thing contained, the causes for the effect (as "reading Shakespeare," or "he threw the tomatoes" for the can of tomatoes.) By comparison, the substitution in metaphor is harder to categorize although there is generally some basis for analogy, characterized as the "ground" of the figure. The transfer can be "novel," made at the time of speaking or "frozen," where the figure of speech has become to a certain extent "conventionalized" in the speech community ("my heart leapt"). The process can go so far as lexicalization, where the metaphorical sense becomes an alternate definition, eventually finding its way into the dictionaries, (as in "cold" person referring to responsiveness as well as temperature.) Many terms in a language (such as "pastor") are in fact metaphors where the secondary sense has replaced the primary. Breal (1897/1964) points out that many of our Latinate terms have metaphorical etymologies (educare, to draw across becoming "educate") but most speakers are, of course, unaware of the force of the metaphor. Taking this to an extreme, Sparshott (cited in Shapiro and Shapiro, 1976) comments that "a language is nothing but a necropolis of dead metaphors." As the Shapiros note, even a dead metaphor can be revitalized by use in a novel context. In this paper metaphor is its own metaphor for the whole spectrum of non-literal language.

1. Referential invention and convention.

Our naive opinions about words may be misleading. We traffic in words as if they had more meaning than they do, as if their intensions were stonger and more binding than perhaps they can be. We know words and use them in contexts -- heavily determining contexts -- yet we propose that we can take them out of those contexts and "define" them, according to Aristotle to tell what class of word they are and what distinguishes the particular word under scrutiny from all other words of the class. Along with Alice, we rail at Humpty Dumpty when he says that he can make words mean whatever he wants them to mean. This is alarming; if Dumpty can do this, how are we to know what he means? How will we ever know what he is trying to say? And if it pleases him to change the meanings of his words all the time, how will Dumpty children ever get the idea that words can mean?

In fact words and their meanings fall between the two poles of convention and invention. They are neither fixed, immutable, completely delimitable, nor are they completely open, applicable without regard to previous uses. Their definitions are neither uniquely linguistic, divorced from world knowledge, but nor are the meanings completely supplied by the discourse context.

We have on the one hand a current from mathematical philosophy, found in early transformational formulations, that would try to specify defining characteristics exhaustively and definitively. In fact, in mathematics or in some artificial languages,

words take their meaning by stipulation (Lakoff and Johnson 1980): a triangle is not a triangle unless it has three angles, a number is not "even" unless it is divisible by 2 with no remainder, and "goto" corresponds to a specific machine code in a specific machine. But these meaning assignments may not be prototypical for words in general (even open class words like our nouns and verbs, leaving so-called grammatical functors aside.) In fact, names for things, common nouns may be closer to indexicals -- like proper names and pronouns -- with which they are generally contrasted.

Some speech communities will adopt stipulated meanings or invent words to achieve secrecy, as with cant and argot, but in the main, we go along with Grice: we want to maximize the communication in our utterances. But we also have to maximize the range over which our utterance system will be useful. If our words are too specific in meaning, they will be useful only in a narrow range of contexts. If the figure has to conform to mathematical standards to be called a hexagon, then we cannot call the map of France a hexagon, but we can. Partial specification of meanings expands the number of possible referents. Then within our system of language use, we have means of "precization" -- a term borrowed (perhaps now inaccurately, as they have given it a technical definition) from Ballmer and Pinkal in Approaching Vagueness (1983). Some of these are linguistic, most importantly in the understanding of "hedges", a term introduced by Lakoff (1972) as his application of Zadeh's logic of fuzzy sets to linguistics. The other means of precization will be pragmatic. Pinkal and his colleagues essentially are modifying systems of classical logic so that speakers (and hearers) can provide parameters within which to make truth-value judgments for indefinite or underdetermined statements such as "John is tall" or "X is a bird." This is accomplished through modifiers like "for a football player" or "strictly speaking." Their argument becomes quite technical and I will not be able to do it justice within the context of this paper, but let us take from this field of investigation this lesson: sentences and the words within them incorporate a high degree of indeterminacy and exploit that quality to advantage.

What this may mean for word definitions is that for the bulk of our words our language provides, in the form of "intensions", approximations only. Our dictionary definitions will present collections of characteristics (features or whatever the notation) more or less closely associated with the word (or a consensus of opinion about the word) -- and some disjunction of the defining terms will normally apply in any given situation. Rosch (1977) and the prototype theorists in general argue for disjunctive definitions and a Labov (1973) experiment demonstrates a similar gradient of application for "clear" denotational terms like "cup", "bowl", "glass". Labov, too, argues for this kind of disjunction, and this fuzzy application of referential terms.

Another curious fact about our lexicon is that polysemy (several meanings for one word) is the rule, especially for the most common words. A J.B. Carroll estimate for ETS (1970) puts it at 43% for all words in their sample and at 72% for the 1000 most frequently used words. Fries (1950, p.83) tabulates separately numbered senses for the most common 1000 words. The range is from 3 to more than 50 per word, with the average in the 20's. What does this apparent overloading of tokens buy for us?

Basically it lets us get on with fewer words and keeps the words we have shorter. Our standard dictionaries list over 400,000 English words, but most speakers use many fewer. Even Shakespeare's total of different tokens falls below 30,000.- (Smith 1949) We seem pretty capable of using the same token with different meanings in different contexts. In fact, our tolerance for the kind of ambiguity this produces is so great that we were rather surprised at how hard the task was for machines when they were first put to it. In the name of economy, we seem to have gladly given up that extra measure of determinacy in favor of a system of context dependence that requires flexibility.

Which brings us at last to the topic of metaphor. The same principle of economy that leads to polysemy recommends metaphorical usage. If a word can be used for any one or any combination of its definitional features, the expressive capacity of our current word stock is immediately expanded exponentially (loose use of the word). The drawback, that each word is ambiguous with respect to itself, is already being handled by the disambiguating capacities of our processing of contexts, both linguistically, through discourse markers like hedges and other coordinates (Lewis's 1974 term) and non-linguistically, through pragmatics. (This is the new rug under which to sweep all loose ends, replacing the lexicon of the 60's.)

We should not, in fact, restrict metaphor to a purely linguistic phenomenon. Verbrugge (1979) presents examples of non-linguistic metaphor which he suggests may be the primary experience, only later "lexicalized" into language. For metaphoric perception, he points to say, viewing a cloud as a lion, or for metaphoric action, riding a stick as a horse. (--or as both at once, looking for the stick and riding on it too. Verbrugge (1980,p 79) cautions against interpreting metaphoricity as "a property of sentences,...but [rather as] a type of dynamic relation holding over utterances, language users, and perceived or imagined settings...." Further, it follows then that metaphoricity is not a property that "can be ascribed to sentences abstracted from communication settings." (p.80) We should not look for metaphor and likewise meaning "contained" in words (see Reddy 1979 on the "conduit metaphor") but in the "relation between symbols and users." Verbrugge chides us, as do Lakoff and Johnson (1980), for being the victims of our own too-successful metaphors about language (including metaphor.) To say a sentence is a "structure" prevents us from seeing a sentence as an "event," a conception he prefers.

As we will see in Section 2, understanding this very constructed relation between user and symbol is essential to the interpretation of sentences in general. The symbol ultimately bears less of the weight of the relation than we imagine. The interpretation of anomaly is a case in point. We have trouble coming up with totally anomalous sentences. Pollio and Burns (1974) took sentence shells, mixed the words up like "Jabberwocky", leaving the grammatical impression of a sentence, and then passed them off to the subjects as words to old songs and old political slogans. Just given the invitation to "tell what they might mean" subjects either created contexts or stretched word meanings and found almost every utterance interpretable. What is more, they were interpreted and were memorable to the same extent as the unscrambled sentences. (That colorless green ideas sleep furiously is now canon.)

Literal meanings may end up to be just averaged decontexted meanings, but this will not give them primacy in a speech situation. Thus far metaphor has come up in what tests as there have been as processed as quickly and perhaps remembered better than literal expressions. (Petrun 1983, Glucksberg et al. 1972) In fact for us to know whether a sentence is metaphorical, we need to know more than the words. "At night all cats are black" might be either literal or metaphorical in different settings.

Where then does such a perspective put metaphor in the lexical scheme of things? Not, as a set of after the fact "compression" rules, a la Kintsch (1974) or tributary to the literal (Katz and Fodor, 1963), but in a system of "fuzzy" reference to begin with, as a primary alternative, requiring no special apparatus, almost indistinguishable from "straight" reference, except to the extent that our "metacognitive" abilities will identify the two kinds of reference (and perhaps others) as distinct.

Is this view consistent with the way word reference and metaphor are observed to develop in children?

2. The growth of referential development

What do we know about how children learn word meanings in general? Do they seem to develop this context sensitivity? How do they fare in tasks demanding

semantic flexibility? We may want to inquire whether fuzziness of reference and indeterminacy are help or hindrance in the learning process.

Nelson (1985) gives us an account of word meaning that accommodates these features. She charts a progressive development encompassing three levels: one relating words to the world; a second relating words to concepts; and a third relating words to other words. The levels appear in that order, building on each other, until in the full-blown system all three co-exist. The initial mechanism she posits for acquisition is an event representation in which the word is embedded. This event representation is analagous to the "frame" in Artificial Intelligence. The familiar child-care routines create structured contexts where the child can anticipate the roles of the participants, the sequence of events and whatever props are involved. Certain vocalizations may become signals within the event and be produced only in that context. The very first words then are very context dependent and are not generalized outside of certain activity routines. Rescorla (Nelson et al. 1978) tells of the child who, on hearing the word "car," got up from the picture of the car she was looking at and pointed from the window, the normal context in which she used the word. The next step comes roughly around the milestone of the first 50 words and the vocabulary naming explosion. New words are immediately generalized across contexts outside of the events they occur with. In that sense, Nelson calls word meanings concepts because they are not tied to a specific referent. But relations between words still seem explainable by reference to these event schemas. Early associations are syntagmatic, reflecting the roles of the objects or people in the schema. Where paradigms begin to occur, they are based on shared roles within the schema for different objects that could fill the same "slot." As such, they are based on differences, rather than similarities. Only later are the concepts analyzed into parts, and aggregates and eventually into the taxonomies which relate words to other words, Nelson's semantic level. Word learning can go in either direction -- either from direct referential experiences opening up a "slot" to receive new information, or conceptually where a non-verbal conceptual element can be matched with a word that seems to fit it.

The levels are not distinct and co-exist even in adults. Nelson claims that even as adults in specific communication settings we have direct word referent links when they are adequate. To answer "Who ate the apple that was on the counter?" we don't need to access our hierarchy of foods and fruits or our schema for digestion, etc. But as adults we have the greater ability in being able to "decontext" our words, to think of them in whatever context is created by the discourse, or manipulate them in a universal context, for say mathematical or logical thinking. The more predictable the context of the utterance, the less "information" in the word. But as words move out of set contexts, the same word brings more information, without necessitating a change in the child's mental representation. The same word can work at all levels, being "shared", that is indexical in one context but not in another -- just as the same object may have different qualities in focus at different times, a piano being played vs. the same piano being moved.

Early conceptual children seem to have no difficulty with polysemy, using say "ba" for bath and for bottle, and although there is sometimes resistance to different names for the same thing, this is quite common in a child's environment where parents have different names for each other than what siblings use and so on. It is also quite common for children not to understand what is said to them: yet they rarely question the speaker. In Carey and Bartlett's "chromium" experiment (Miller 1977), few of the preschoolers questioned what "chromium" meant, but just chose the most obvious candidate, given the choices. This of course puts the burden of teaching word meaning on a structured environment, but that seems to be pretty

universally true.

As for disjunctive application of meaning elements, Rosch (1977) points out that since Bruner, Olver and Greenfield (1966) complexive groupings are considered the norm for the child's early categorization. Asked to "put in the ones that go together," the child will take the yellow square with the yellow circle, then the red circle to go with the yellow circle and so on, rather than maintain a single criterion for the whole group. So, that could be a moon because it is round, an orange because it is orange and so on. This aspect of such a system would be perfectly natural for the young learner.

In such a context, where do we see the entrance of figurative language? Do the observational data show evidence of flexible, complexive word meanings from early on?

The development of figurative language , virtually ignored in the 60's, has undergone fairly close scrutiny in the mid to late 70's, especially through the work of Gardner (1975, 1978) and Winner (1979, 1980) and their colleagues, and Ortony (1978, 1983) and the Pollios (1974, 1977). Studies of comprehension show that until adolescence children's understanding of metaphors and similes is deficient compared to their facility with literal language. Curiously, preschoolers' production of figurative language is at a higher level than it will be again until high school age. Gardner and Winner (1978) show this propensity and then defend its claim to figural status on a number of grounds. First, there is direct evidence that children are aware of pretending -- and in pretending can rename objects to suit their context. Studies have assessed the degree to which these renamings are not just from lack of vocabulary or misapprehension of the objects, lending support to the child's attempts as truly analogic word uses. (Hudson and Nelson 1984, Mendelsohn et al. 1984, Billow 1981, Vosniadou and Ortony 1983)

While undeniably, the figurative process is cognitively more complicated in the adult poet, it seems to me reasonable, that once past the naming insight, the child has both the desire to point out likeness and the means. Appreciation of similarity is probably one of our most basic skills; if we are to believe the ethologists, it is definitely pre-verbal. Once children have labels, they have the tools for voicing comparison. It is interesting that Harris (1982) and Winner (1979) record instances of metaphor well before similes, showing perhaps that children want to record comparisons before they have the explicit vocabulary for it, and that their urge to compare is facilitated by the loose basic requirement for reference -- i.e. in a tight enough context you can get away with some verbalized pointing; if you have enough shared experience, you can use any "close" word. It seems to me unmotivated to reject their attempts at it.

Meanwhile, it is well-documented and also in accord with our casual observations that children in the early school years actively reject figurative interpretations in favor of literal. These rejections can be authoritative statements that "a person can't be hard" or the embarrassing exclamations: "but you said Grampa was on your back and he's not, he's sitting in the chair, see?" At this age, when given alternatives to choose from the 5 to 10 year old will choose literal and conventional endings a greater percentage of the time that those younger or older do. This U-shaped curve of metaphoric preference is the specific phenomenon that I am addressing.

One way to explain it is to say that the use of figurative language by adults and young children is not the same activity and that production, like comprehension, begins in late childhood and shows a gradual improvement with age (as do almost all intellectual activities.) Child talk, on this view, is cute but misinformed.

My preference is to say that comprehension and production are the same but that the ability to talk about language and what it means is later. This is how we

get kids who appear to be able to produce what they appear not to be able to understand. When they say something, inappropriately, it is interpretable through the same system that interprets the whole range of utterances. When we realize that even "literal" statements are approximate and relative and more difficult to explain than respond to, the focus of our investigation changes. In order to talk about metaphor, children must first become aware of language as an object of attention. Actually, in order to "do" a lot of things with language, children need this awareness. The process of moving communication out of shared context requires techniques to circumscribe the natural relativity of its terms. The mature speaker does this locally, within the discourse. But before achieving this selectivity, the child acquires it first globally: "This word applies ONLY in this way." It is harder (and later) to restrict words in one context at a time.

So, if children begin to form opinions about words which apply "across the board," what consequences will this have in their word use. One obvious one is that they will become too rigid. When we see them "getting rigid," then we can take it as a sign of growth. Eventually they will have to regain flexibility, but with more selective control.

3. The growth of metalinguistic awareness (mla)

The 5 year old has often been regarded as essentially having mastered the language. The developments from 5 to 12 are considered "fine-tuning." To achieve this next measure of growth, the child's focus on the elements of language is enlisted. This is true for development of reference as well as for other aspects.

The downturn in figurative use, I contend, is not associated so much with increased knowledge of specific words as with an increase in awareness of words in general. For lack of a better term, I will call this faculty "word-smarts."

This notion of metalinguistic awareness from a research point of view, is in its infancy. There is still a lack of consensus as to what the construct is, much less how to measure it. Clark's review article (1978) claims that self-corrections or monitoring and even sound or word play (as in Cazden 1974) indicate such a level of attention. I am not sure, but I don't think it matters here. Certainly we can say that this shift is accomplished in order to produce the conscious (self-righteous) correction of others' speech that appears liberally in the diary literature. (Horgan 1981, Clark, Slobin 1978, Chukovsky 1963) Some grammatical judgments have been elicited inferentially for 2-year-olds but explicitly in the 5 to 8 year range. (Gleitman, Gleitman and Shipley 1972) "Failure" on these tasks is hard to interpret, but positive results show a good deal of ability. These unsollicited corrections ("you hafta say it this way or that") bear witness to the 4 to 6 year old's knowledge of prescriptive rules.

In terms of conventions about words, we can turn our attention to children's growing awareness of the form and function of definitions. These also exhibit a shift from syntagmatic word relations "a hole is to dig" to paradigmatic "a hole is something that..." Investigations of children's definitions (Watson, 1985) show increasing ability to use the forms of adult definition, although there, too, ability to define is considered a different level of skill from that of "knowing its meaning" and using the word correctly.

To date, most of the evidence comes from case studies, especially of the verbally precocious children linguists in particular have the habit of raising. What I feel we need is some "experimental observation" of normal children to watch in particular the development of a kind of "word sense" -- my "word smarts," the kind that might be responsible for their temporary rejection of metaphor. What I am looking for are the linguistic or paralinguistic behaviors (as opposed to psychological constructs like "decentering") that interact with an openness to figurative language.

The Experiment:

As a preliminary step toward showing causation, that metalinguistic awareness initially depresses metaphoric preference and later promotes it as set out in the introduction, I feel we need to show at least correlation. The prediction specifically is that the dip in metaphoric preference corrresponds to an initial rise in the child's sense of what a word is and does. As "word-smarts" continues to grow, it will eventually encompass metaphoric processes as well, so the metaphoric preference should reassert itself. The upturn in the curve of metaphor preference should take place before the time when children can explain metaphors and why they choose them.

For the metaphor measure, I will just use an adaptation of Winner and Gardner's technique. However, both metalinguistic awareness (MLA) and reference are global concepts whose implications are unlikely to be exhibited in a single activity in a single experimental situation, and they have not been worked with so closely. There is no agreement as to what level of awareness it operates on, whether it is a complex of skills or unitary, whether such skills would develop synchronously or asynchronously. According to Nesdale and Tumner's 1984 article, the "methodological overview" is not encouraging. What we have at present are a diverse group of researchers trying out their equally diverse intuitions on what MLA is and how it can be operationalized.

I will adopt, therefore, the strategy of Saywitz and Wilkinson (1982) to use a convergence of multiple measures to help determine which are the most valid assessments. (They chose 11 test items, modeled after paradigms found in the literature and deleted 1 from the final analysis because they did not feel it proved a reliable measure. The tasks included rhyming, correction of illogicality, detection of lexical ambiguity, different kinds of segmentation, word order recognition, word-magic and word shape questions.) While the specific target of my research is whether words are perceived as having referential limits, the notion of word-smarts should be a complex composed of any elements -- phonological, syntactic, pragmatic as well as semantic -- which serve to bring attention to the word as an object. A composite measure can be graphed with respect to the metaphor graph and then the various elements that make it up can be separately analyzed to see which are most closely tied to the metaphor behavior. Like Saywitz and Wilkinson, I think it will be important to have a measure of linguistic abilities, from say the Northwestern Syntax Screening Test, although IQ is not a factor I feel a need to control for.

My initial goal is a correlation of this composite measure with the figurative behavior; ultimately, I want to shed light on the more general flexibility through which we evaluate all meaning, figurative and literal.

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PROCESSING STRATEGIES AS COUNTEREVIDENCE TO MENTAL MODULARITY

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Introduction

The proposal that the language faculty consists of a set of interacting modules has, over the past few years, come to be regarded as a major advance in linguistic theory. Its best-known proponent is Chomsky, who has argued that the formal language system consists of a number of individual modules, each with its own internal structure and properties, and each interacting with the others in a systematic way (see Chomsky, 1982; van Riemsdijk & Williams, 1986, Part IV). The modularity thesis has also been extensively elaborated within cognitive psychology, perhaps most convincingly by Jerry Fodor (1983, 1985). In his 1983 monograph The Modularity of Mind, Fodor presents an eloquent and empassioned case for a view of the nature of the mind quite distinct from that currently in vogue among cognitive psychologists.

It is to an analysis of Fodor's conceptualization of mental modularity that this paper is addressed. It will be argued below that empirical results from a variety of psycholinguistic studies suggest that a strict interpretation of Fodor's modularity thesis cannot be maintained, although an alternative view, one which relaxes certain of his conditions, can be shown to be compatable with those results. First, however, it is necessary to sketch Fodor's thesis in some detail. After this, we will turn to a brief discussion of several psycholinguistic experiments which, it will be argued, constitute counterevidence to Fodor's view of modularity.

Fodor's Modularity Thesis

In contrast to the more conventional views of "faculty psychology," Fodor argues that the mind consists of three distinct types of components. At the center is a "central processing system," the place where belief systems are fixed, knowledge is integrated, and synthesis takes place. Feeding information to the central processing system is a set of input systems or "modules" whose task it is to construct mental representations for input which enter the modules via "transducers." The transducers convert the input into appropriate types of representation which are then operated on by the computational machinery of the modules. Fodor claims, for example, that there are several input systems or modules associated with vision, one dealing with color perception, another with shape, and yet another with spacial relations. A

crucial feature of Fodor's thesis is that each module has its own unique computational machinery, and the function of each module is to construct a mental representation for those distal stimuli within its proper domain, representations which are then fed to the central processor for analysis. It is with the modules and their very special characteristics that we are most concerned here, since, to Fodor's credit, he offers definite defining characteristics for modules, thereby making them vulnerable to empirical assessment.

According to Fodor, each module is "domain specific," "computationally autonomous," and "informationally encapsulated." By domain specificity, Fodor means that each module is especially designed to construct mental representations for input from only one specific domain. For example, the module which takes as input the sounds of an utterance and from them constructs a structural representation for sentences is completely distinct from that module which constructs mental representations for visual arrays. Both of these are distinct from that which serves to construct mental representations for tactile information from the fingertips. Domain specificity is an important and crucial defining characteristic of the modularity thesis. Fodor argues that the module responsible for syntactic analyses for incoming language data constructs a relatively superficial surface structure phrase marker for each sentence, but it does not provide any semantic information for that representation. The final syntactic representation then flows to the central processor, where a semantic interpretation is constructed and integrated into the belief system of the hearer.

The claim that each module contains its own unique computational system is what Fodor means by computational autonomy. Moreover, Fodor claims that computational autonomy requires that there are no commonalities of operations across modules. Any characteristic of a given module which happens to appear in another is present in each only by virtue of independent module evolution. This view, then, rejects the possibility of what Fodor calls "horizontal faculties," mental operations which are involved in several modules. Instead, he champions what he calls "vertical faculties," those which are unique and specific to only one module.

By "information encapsulation," Fodor simply means that each module constructs its own representations totally independently of any other information. For example, in constructing the syntactic representation for an incoming sentence, information encapsulation insures that no information from the central processor may flow back into the module and guide its construction of the mental representation it is building. This view makes the claim that knowledge from context or discourse, for example, does not impinge on what particular syntactic representation is constructed for a sentence, although, of course, it could be highly relevant to the way in which that representation is analyzed once it reaches the central processor. In short, the direction of information flow is

constrained to move from the outside inward, with no feedback. Fodor suggests other characertistics of modules as well, but it is on those discussed above that our attention will focus.

In order to constuct an argument against Fodor's view of information encapsulation, for example, it is necessary to show that information from other sources than just a particular sentence can influence the structure assigned to that sentence. Similarly, if it can be shown that some particular mental operation is associated with several modules, it then follows that we have a plausible argument against domain specificity. It is just this sort of argument that we now turn to. In order to develop the arguments, it is necessary to discuss briefly the results of certain experiments, results which, it will be claimed, constitute evidence for the existence and operation of certain cognitive strategies in several distinct domains within language as well as from other domains. We will first discuss the nature of cognitive strategies and the research program which incorporates them, and then we will turn to experimental results which provide them with rather strong support. Only then can the full strength of the argument against the strong modularity thesis be mounted.

Cognitive Strategies

In the earlier literature dealing with cognitive strategies, (see Bever, 1970; Fodor, Bever, & Garrett, 1974), a strategy was conceived of as a heuristic which a hearer uses to construct a surface structure, and from that to induce the grammatical relations within a sentence, to relate various sentences to each other, and to provide a basis for the construction of a semantic representation for the sentence (Fodor, Bever, & Garrett, 1974, esp. pp. 328ff). However, within that earlier literature there can be found striking confusions between syntactic and semantic properties as well as between language-specific and language-independent, or universal, aspects.

Under the perspective adopted in this paper, a strategy is construed as a language-independent principle deriving from underlying cognitive properties. According to this view, a particular strategy, while not tied to the grammatical specifics of a given language, nevertheless interacts with those structures in order to process utterances in the language. It is important to bear in mind that while we shall be referring to the effects of strategies in language processing, they are, it will be shown, relevant to other cognitive domains as well.

One of the most important strategies to emerge in the psycholinguistic literature is that of CLOSURE. This strategy is associated with cognitive processes other than language. A considerable array of empirical evidence exists in the psychological literature to support the claim that the principle of closure is at work in visual perception. Wessells (1982, pp. 22ff, 55ff) and Bever (1970, pp. 282-284, 330-333) provide brief reviews of

the relevant evidence. The strategy is also involved in our perception of music, as evidenced by the well-known phenomenon of finding a particular musical passage somehow incomplete until the "correct" final note or sequence occurs. The strategy suggests that in processing a perceptual array (visual, auditory, musical, etc.), the perceiver attempts to impose a unified structure on the array, to construct a unifying and integrating mental Gestalt.

When we turn to language processing, and keeping in mind the relatively ephemeral nature of the acoustic signal and the quite small capacity of our short term or working memory, we can formulate the strategy roughly as follows:

> CLOSURE. In processing a particular linguistic unit (phrase, clause, etc.), the language user (speaker or hearer) attempts to complete that unit as early as possible.

Evidence in support of CLOSURE has been advanced in the psycholinguistic literature as well as in other cognitive domains. Some of the early evidence includes the click studies of Fodor and Bever (1965), in which it was found that subjects perceived superimposed clicks closer to major constituent boundaries that they actually occurred, suggesting that the hearer tends to complete the major phrase and close it off before he is free to devote processing resources to to the detection of extraneous noise. Further evidence, from Slobin (1973), suggests that children have difficulty with structures in which one clause interrupts another, while they have far less difficulty with non-interrupted structures.

At this point, experimental evidence will be offered in which it is shown that CLOSURE is at work in both comprehension and production. The experiments to be discussed below are reported in detail in Prideaux and Baker (in press). They deal, by and large, with structures containing relative clauses. If a relative clause is attached to either the subject or object of a basic English SVO sentence, the following two structures result:

1 a. S+RC V O
The man who found the money received the reward.

b. S V O+RC
The girl spanked the cat that ate the fish.

CLOSURE predicts that (1a) should be more difficult to process that (1b), since in the former structure a relative clause interrupts the main clause. This means that for (1a), the hearer must suspend his processing of the main clause, hold the head NP in memory, process the relative clause, attach it to the head clause, and then complete processing of the main clause. For (1b), however, the entire main clause can be completed, shunted off to

semantic memory, and then the relative clause can be processed, and "addressed" to the relevant nominal in semantic memory. For English, then, sentences with relative clauses on final (object) NPs should be easier to process that those in which the relative clause is attached to the subject NP.

In a series of experiments focusing on comprehension, this prediction was tested. In one experiment, subjects were presented sentences word by word on a computer-controlled CRT screen, with the advancement to the next word under the subject's control. Response latencies between words were measured. It was predicted that the response latency after the relative pronoun should be shorter in structures like (1a) than in those like (1b), since in the former case, a complete clause had not yet been formulated, while in the latter, upon completion of the main clause, there should be a period of integration. In this experiment, which employed 64 subjects, each of whom examined 32 sentences, the effect of CLOSURE was found to be highly significant under an analysis of variance ($p < .01$). In addition to the self-paced task, subjects had a second task. Upon completion of a given sentence, they were required to recall the previous sentence. In the recall task, subjects tended to take structures with an interrupting relative clause, and reconstruct them with structures without interruption. The reverse situation, however, occurred very infrequently. These results support the operation of CLOSURE in both comprehension and production.

In a further study, subjects were asked to watch a short (eight minute) silent TV clip, consisting of a series of scenes in a bar. They were then asked to describe the events they had witnessed, and the structures they used were analyzed. Using a chi-square test, it was found that far more relative clauses were attached to final than to medial NPs, with a level of significance of $p < .001$. Next, a series of text analyses was carried out on both fiction and non-fiction texts. Again, final relative clauses were far more frequent than interrupting ones, with significance levels always greater than $p < .001$.

Finally, in order to ascertain that the tendency for relative clauses to be more readily attached to final than to medial NPs was not just a property of English, data from Japanese were also obtained. Japanese is a SOV language in which the relative clause precedes the modified NP. Thus, structures like those in (2) occur in Japanese:

2 a. RC+S O V
okane o mitsuketa otoko ga sharei o moratta
"The man who found the money received the reward."

b. S RC+O V
shojo ga sakana o tabeta neko o tataita
"The girl spanked the cat that ate the fish."

In these cases, CLOSURE predicts that (1a) ought to be easier to process than (1b), since it is in the second case that clausal interruption takes place. In other words, sentences with relative clauses attached to the subject NP ought to be easier to process than those with the relative clause attached to an internal (object) NP. In terms of the grammatical roles of the NPs to which relative clauses are attached, this prediction is just the opposite of that for English.

To test this prediction, a set of acceptability studies was carried out carried out in which native speakers of Japanese were presented with sentences like these and asked to judge which were relatively more natural than others (see also Prideaux, 1982). It was found that the CLOSURE predictions were supported at a significance level of $p < .001$. Similarly, Kawashima (1980), using a toy moving task, found that Japanese speaking children had far more trouble in both comprehension and production with interrupting structures than with non-interrupting ones. Choi (1979) examined similar structures in Korean, a language which shares with Japanese a basic SOV structure and relative clauses which precede the modified NPs. Her results, like those of Clancy, Lee, and Zoh (in press), support the viability of CLOSURE in Korean language acquisition.

In summary, we have offered support for the existence and operation of a general cognitive strategy of CLOSURE, a strategy which is involved in language processing as well as in other cognitive domains. Within language processing, CLOSURE operates in production, comprehension, and even acquisition. Moreover, it operates across modalities, since evidence appears for it in the processing of written as well as aural language, and in comprehension, production, and acquisition. Finally, there is evidence for the operation of CLOSURE across languages having very different structural properties.

Conclusions

In the absence of a radically different interpretation for these results, we can conclude that a general closure strategy is operative across modules. It operates within visual perception, in several aspects of language processing, including both comprehension and production, and in both aural and visual modalities. According to a strict interpretation of Fodor's modularity thesis, such a general "horizontal" faculty should not be permitted. The only way such a situation could arise would be, in Fodor's terms, through independent evolution in each module. Such an unparsimonious proposal can only be accepted if there is overwhelmingly strong evidence available in its support. Far more parsimonious would be the position that in fact certain horizontal faculties are permitted when the evidence demands it.

While the results cited here constitute evidence against a strict version of Fodor's thesis, a somewhat less strict version

of modularity can be supported. In this version, distinct modules are still associated with different types of processing (visual arrays, color perception, acoustic, reading, writing, speech production, etc.), but each has access to certain horizontal faculties. Such faculties serve to inform and govern the computational procedures involved in certain of the modules. While such a theory is perhaps less elegant, it is more realistic, given the available evidence.

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AGRAMMATISM IN APHASIA: A CLARIFICATION IN LIGHT OF CHINESE APHASICS

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Agrammatism has been a subject of interest in neurolinguistics in recent years. But it actually began to receive attention from aphasiologists as early as the turn of the century (1902-1922). Although many articles and books have been published in aphasiology (and lately in neurolinguistics as well, cf. Kean [1985]) since then, very little is known about agrammatism in Chinese aphasics regarding the nature and extent of this form of disturbances in their language behavior, not to mention the general understanding of agrammatism in relation to language and brain functions. The following is an exemplary statement from an often-quoted aphasiology textbook:

> It is necessary to discuss two terms which have long been conspicuous in neurological writings, namely agrammatism and telegrammatism. We do not pay as much attention nowadays to these concepts as formerly. Agrammatism is naturally a more important feature in aphasiacs whose natural language comprises one of the highly inflected tongues, and in such the defect may entail considerable errors in the employment of prefixes and suffixes. With this in mind, it would be interesting to make a comparative linguistic study of the pattern of aphasia in patients belonging to difference races. Aphasia in the Chinese (where the language is virtually devoid of syntax) would be a particularly valuable object of attention. Agrammatism is a term which we shall probably continue to employ, if only for a limited period, and it may be defined as an aphasic disorder which impairs syntax rather than vocabulary.
>
> Telegrammatism is a purely descriptive expression and refers to that type of aphasic speech or writing where preposition, articles, conjunctions — the operators, or so-called 'filler words' — tend to be omitted, while the 'full words' are more or less spared, i.e., the nouns, verbs and adjectives which are usually more concrete in their nature. Telegrammatism is a feature of aphasic speech in the case of agglutinative rather than inflected tongues. The resulting diction or script is terse and abrupt, reminiscent of the poverty of language utilized in concocting telegrams. There may also be a resemblance

> to the various pidgin languages employed at intercultural levels as a make-shift mode of communication. Though the concept of telegrammatism is not an important one, there is no reason for it to be discarded, for it possesses certain descriptive merits. It may be defined as the type of speech which results after the sacrifice of the shorter terms which are less heavily charged with reference-function, or 'meaning' (Critchley 1970:16).

From the point of view of neurolinguistics, however, agrammatism and its related forms of language disturbances are very important indicators of how the brain as a whole (or even the mind) works vis-a-vis language behavior which represents humans as against nonhuman primates. Put differently, how the normal brain is supposed to work in its intact state is reflected in how the damaged brain continues to function in language behavior which is found to be defective and agrammatic. But the fact remains that agrammatism and its related forms of language disturbances are still relatively little known, chief among the main reasons being that not enough data have been collected outside the domain of European languages (notably German and English). The present article is intended to fill such a gap, no matter how small its contribution. One comforting but highly significant point to make at this stage is that the Chinese language is not virtually devoid of syntax, but rather full of syntax; as a matter of fact, Chinese grammar is nothing but syntax and semantics and, therefore, any breakdown of its syntactico-semantic properties constitutes a serious violation of its grammar. It is this breakdown or violation of grammar in the patient's language behavior that is the main focus of my presentation. The following is a brief medical history of this patient whom I shall call L.K.

L.K. was a 60-year-old right-handed Chinese man who was well until one week prior to admission because his family noted that he seemed "confused." His family members also noted that he slurred his speech and that while he could not name some familiar objects around the house he also lost his ability ot calculate, calculation being part of his daily business. When he was admitted to the Far Eastern Memorial Hospital, the chief neurologist, Dr. Yiu-Tong Chu, observed and examined him and found that there was no motor impairment physically nor was there any sensory loss, other than his speech problem, because he was alert, well-developed, and cooperative; however, his ability to identify objects placed in the right hand was impaired. Nonetheless, he was alert and able to follow commands. For instance, he could write his name with his right hand, when told; upon request, he could also imitate such actions as lighting a match. A series of

neuropsychological tests for the purpose of conducting a neurolinguistic investigation followed. The results were such that repetition was fluent but paraphasic and that although his natural speech was fluent he was poor in naming. Also noted were severe agraphia (other than writing his own name), finger agnosia, acalcuia, and left-right disorientation. Neurological examination was otherwise normal. But CT scan of the brain revealed a Lt. parieto-occipital infarction. This patient was, therefore, diagnosed as a case of conduction aphasia.

Of his various deficits one stands out distinctly, which is agrammatism. However, this patient's agrammatism differs considerably from that reported in the literature, partly because the concept of 'grammar' as employed by linguistically naive neurologists is mistaken, at least from the linguistic point of view, and therefore any disturbance of grammar defined so erroneously could not be properly called agrammatism, and partly because so far no study on Chinese agrammatics has been reported in the literature, and since this presentation is one of the first series of studies on agrammatism in our Chinese aphasic patients, I am entitled to expressing a differing view so as to redefine what agrammatism in aphasia really means. Thus, my purpose is to focus on such features of the violation or disturbances of grammatical properties as may be observed in L.K. so as to come to terms with what agrammatism means vis-a-vis the Chinese language when it is observed in L.K. I should caution, however, that the testing employed in the case of L.K. involved mainly the written language of Chinese, albeit his spoken language was also carefully examined. My reliance on the written language may arouse some criticism on the ground that it was acquired much later — as a second language — than the spoken counterpart, and therefore may not be 'native' to L.K. But I wonder how many native speakers of English (or any other language, for that matter) acquired the written version first, and yet they are all claimed to be native to written English, not to mention that when/if they become aphasic, reading and writing are always part of the testing required of their aphasic assessment. Such being the case, I am of the opinion that my description of L.K.'s aphasic syndromes and the report herewith of his agrammatism based on the written language of Chinese will be of value in the years to come, because it offers useful insights regarding the nature of agrammatism in general — by way of its redefinition — and Chinese agrammatism in particular.

CASE DESCRIPTION

First, note that this patient could not copy sentence or phrases longer than two characters. For instance,

when he was shown word cards that made up the following sentence, niu tsai ch'ih ts'ao (牛在吃草) 'Cattle are feeding on grass" and was told to copy it (i.e., using another set of identical word cards) after that sentence was also read to him, he failed to do so; however, when he was asked to do the same thing with siang chiao (香蕉) 'bananas', he did it but with his own verbal reinforcement, that is, he read the phrase to himself as he performed the task. But when we added more cards to the phrase he just successfully copied, making it a five-character sentence siang chiao hen hao ch'ih (香蕉很好吃) 'Bananas are very delicious', with auditory input as well, he tried to match it three times, while reading the sentence aloud to himself, and yet failed it each time with no grammatical improvement from one trial to another: (1) chiao hen siang hao ch'ih; (2) hen chiao siang hao ch'ih; (3) chiao hen siang hao ch'ih. But note that in each trial he kept the last phrase hao ch'ih 'delicious' intact while varying the order of the first three characters; the interesting thing to observe is that even though siang chiao 'bananas' is incorrectly arranged as chiao siang, which is the reverse of the correct one he had successfully performed earlier is kept constant throughout.

Second, I also tested his auditory comprehension. For instance, he was read the same sentence above (this time without the stimulus as a model in front of him), and asked to construct that sentence using the word cards. He tried it three times but failed in each trial; the results were in error just the same and the phrase for 'bananas' appeared in the reserved order again. This symptom is called perseveration which could very well be a manifestation of memory impairment (Kinsbourne, p.c.).

In addition to the preceding preliminary observations, I also ran a few neuropsychological tests including the following: Reading, Writing, Facial recognition, Repetition, Drawing, Calculation, Geometric Figure Recognition, Finger Recognition. The reading ability was limited to single characters, e.g., niu (牛) 'cattle', kou (狗) 'dog', ya (鴨) 'duck', and chi (鷄) 'chicken'. When reading involved sentences of three or more characters each, the speed with which he read them slowed down as the number of characters increased. For instance, he read shei yao chie tian hua (誰要接電話) 'Who is to answer the phone?' and wo yao huo sia ch'ü (我要活下去) 'I want to live on' extremely slowly; when it came to nan hai la nü hai te t'ou fa (男孩拉女孩的頭髮) 'A boy pulled a girl's hair', he not only read it very slowly, he had to repeat the sentence from the beginning whenever he stumbled over a word in order to complete the reading process. This defect in reading seems to sug-

gest that his memory span could not sustain the interruption of an error. He was, therefore, rendered dyslexic. His writing, on the other hand, was extremely poor; he could write his own name but was unable to write anything else to dictation; he could also write his own home address but failed to write down the above sentences to dictation. He could recognize a face by identifying its components but could not properly identify fingers (such as left index or right thumb) because of his Left-Right disorientation. Repeition (i.e., mimicry) of single words was possible but became an impossible task when the target sentence was three-word long or more. For instance, he was completely lost when asked to repeat siang chiao hen hao ch'ih 'Bananas are very delicious' which was said to him. But of great interest is that when told to repeat siao hai k'u le (小孩哭了) 'The child is crying', he repeated it as siang chiao hen hao ch'ih which he had failed to repeat a couple of minutes ago. Again, this is another significant manifestation of his memory impairment (or perseveration, if you wish). Drawing of a clock proved to be too difficult; nor was he able to draw the shape of a house. Calculation, as expected, was extremely poor. For instance, on the first day of his test, he could only add 1+1 as 2; deduction, multiplication, not to mention division were all out of the question. However, on the second day, he was able to add 2+4 as 6 but could not add 5+1. In contrast, however, he did fairly well on his geometric figure recognition.

On the basis of the symptoms above, L.K. was diagnosed as a conduction aphasic. However, findings of this sort are not enough in terms of neurolinguistics, especially about his agrammatism because he made grammatical errors irrespective of whether he was told to construct a sentence on his own in response to an auditory stimulus or to copy a sentence in response to a visual stimulus (as a model) with an auditory reinforcement, as may be evidenced by the example of 'Bananas are very delicious'. In order to settle this problem neurolinguistically, he was then asked to perform three types of work; namely, [1] sentence constructions based on single-modal stimulation, [2] sentence constructions based on pluri-modal stimulation, and [3] sentence constructions when no stimulation was provided. The results are as follows:

[1] (1) 1st trial che shih shei mao tsu te (wrong)
這是誰帽子的

2nd trial che shih shei te mao tsu (correct)
這是誰的帽子

Gloss 'Whose hat is this?'

(2) 1st trial nei ke wo shih shou piao te (wrong)
那個我是手錶的

		2nd trial	nei ke wo shih shou te piao (wrong)
			那個我是手的錶
		Target	nei ke shih wo te shou piao
			'That is my wrist watch'
[2]	(1)	1st trial	che shih shei mao tsu te (wrong)
			這是誰帽子的
		2nd trial	che shih shei te mao tsu (correct)
			這是誰的帽子
	(2)	1st trial	nei ke wo shih shou piao te (wrong)
			那個我是手錶的
		2nd trial	nei ke shih wo shou piao te (wrong)
			那個是我手錶的
[3]	(3)	1st trial	chia lai ch'i ch'ang ke i ta (wrong)
			家来起唱歌一大
		2nd trial	i chia ta lai ch'i ch'ang ke (wrong)
			一家大来起唱歌
		3rd trial	chia ta lai ch'i ch'ang ke i (wrong)
			家大来起唱歌一
		4th trial	chia ta lai i ch'i ch'ang ke (wrong)
			家大来一起唱歌
		Target	ta chia i ch'i lai ch'ang ke
			'We all come to sing a song together'

Observe that the difference between (1) and (2) is sheer length in terms of structure — the lexical differences being set aside for the moment; (1) has six but (2) has seven words (i.e., charecters). Otherwise, the two sentences are structured in exactly the same way:

che	shih	shei	te	mao	tsu
(nei ke)	shih	wo	te	shou	piao
Demonstrative Noun (Dem. Noun Phrase)	Copula	Pronoun	Particle	Noun	Phrase

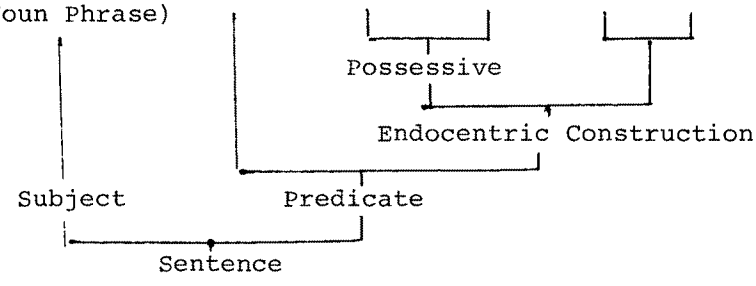

Figure 1. Target Sentences of (1) and (2) analyzed in terms of ICs.

Observe next that although in (1) L.K. did equally poorly for both stimulations (with the correct answer only in the second trials) in (2) he had both trials wrong for either stimulation, an observation which suggests that agrammatism at least in Chinese where syntax

is of utmost importance is probably length-dependent; that is, it is most likely a form of memory impairment (perhaps, in the case of conduction aphasia and not of some other aphasias). Note that when the length was increased as in (2), L.K. could not handle the two function words, shih and te, properly even in the second trials for both stimulations: for the single-modal stimulation, he tried to move te closer to the target place but could not see that shih was in a wrong place; for the plurimodal stimulation, however, he got shih in the right place but "forgot" to also move te to the target place. The length-dependent hypothesis is further evidenced by the fact that when the complexity of sentence was increased, the patient's agrammatism got worse, as in nü ren pu shih ruo che (女人不是弱者) 'Women are not weaklings' which he did extremely poorly; not only was he unable to construct the target sentence using the appropriate word cards, when the stimulus sentence was given to him auditorily once, even when the stimulus was read twice the results still came out wrong, too:

(4) 1st trial che pu shih ruo ren nü 者不是弱人女
2nd trial che pu shih ruo nü ren 者不是弱女人

Here, the sentence was completely wrong in both, except for pu shih 'are not' in the first trial and that plus nü ren 'women' in the second. The structure of the target sentence may be depicted as follows:

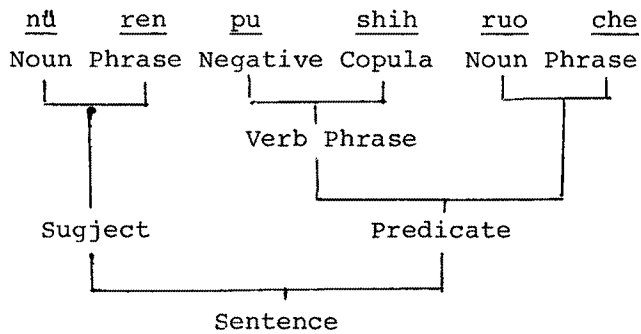

Figure 2. Target Sentence of (4) analyzed in terms of ICs

The increased complexity is seen in the verb phrase which is now made up of the copula and the negative pu which is extremely productive in that it can be concatenated with any verb, not just the copula. Perhaps, as a result of or even owing to such common concatenation, L.K. kept the verb phrase pu shih together at all times but failed to place it in the appropriate position. It is probably this complexity, coupled with the length

which is the same as (1), that caused L.K. to make so many errors, irrespective of whether the stimulus was given single-modally or pluri-modally. This theoretical construct of length-complexity combination was lent further credence by the following analysis of the target sentence of (3) given above:

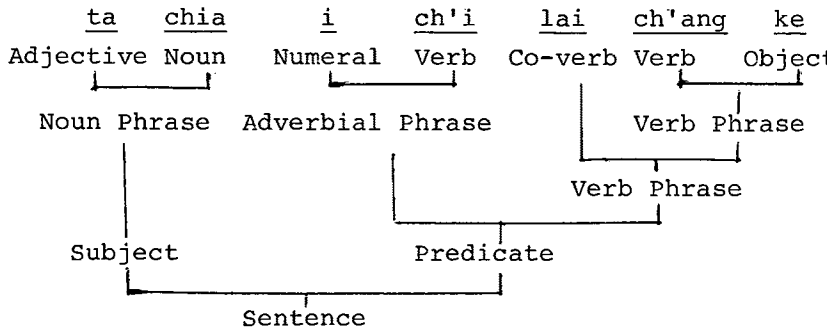

Figure 3. Target Sentence of (3) analyzed in terms of ICs.

Whether or not the agrammatism observed in (3) was caused by the added complexity of its target sentence or due to the absence of a visual and/or auditory simulus serving as a model is hard to tell. However, one thing is clear; that is, L.K. was a serious case of memory impairment probably in both comprehension and production, although spontaneous conversation was rather fluent. I may even venture to say that the impairment of his comprehension is not so much in his understanding my commands — because, if so, he could not have followed my instructions as he did — as in his feedback, that is, in his not being able to understand what he was doing, i.e., not being able to comprehend the result of his performances.

DISCUSSION

First, recall that this patient could copy or construct a sentence in partial well-formedness when and only when there was a stimulus serving as a model; the model could be provided in the visual mode (reinforced by an auditory stimulus of the same input) or in the auditory mode alone. This means that his STM was relatively intact, so that he could rely on it to rehearse what was auditorily given when confronted with the tast of either constructing a sentence or copying it upon hearing and/or seeing the stimulus. This process of rehearsal was evident because he had to say to himself many times the constituents of each sentence following the

initial auditory stimulation. In other words, if he had to read aloud a stimulus visually provided, while copying it, in order to auditorily reinforce his sensory register which in turn relayed the input to his LTM, it means that somehow there was no direct tap of his LTM upon seeing or hearing each stimulus before he could decide what it was that he saw or heard. This lack of direct tap of his LTM became detrimental when a stimulus was given only single-modally, i.e., auditorily without recourse to the visual mode, whereat he could not rely on the presence of the same stimulus for rehearsal. A normal person under the same circumstances, however, could easily recall what was just said, e.g., a sentence like in (4), and immediately reproduce it orally or manually. But L.K. could not do it; even the poor performance shown in (4) took him 2 minutes and 19 seconds, simply because the auditory stimuli did not reach his LTM. If it had, it could be recalled. But it didn't, and therefore he had difficulties constructing it in the absence of a continuing stimulus (i.e., when he could not count on rehearsal). On the other hand, if he could count on rehearsal, so as to tap his LTM, the process of rehearsal would prove very effective for him, such as when the task of constructing or copying a sentence was preceded by reading aloud on his own the target sentence a few times just before he was to perform the task.

The above observation inevitably gives rise to a hypothesis which says that if the grammatical information L.K. needed was not readily available, it is not that the grammatical system in his LTM had broken down due to the damage in his brain but that he could not have access to it for modulation, even though it might still be intact. In other words, it is the inaccessibility resulting in the lack of modulation rather than the breakdown that is the cause of his agrammatism. The concept of "inaccessibility" in the present context may be taken to mean the problem of retrieval of stored information owing to the lack of modulation, rather than the breakdown of the grammatical system itself that is stored in the memory.

To corroborate this hypothesis, I ran a test which required only the activation of his STM without having to retrieve any information from his LTM: I asked him to copy Japanese kana (three lines of the syllabaries, both kata kana and hira gana) which he saw for the first time in his life, using the same method; although it took him 40 seconds or so for each line, with one minor exception he did the rest correctly. This test supports the hypothesis that L.K.'s agrammatism stemmed from the impairment of the retrieval system of his LTM and that his STM was relatively intact which could be activated visually or auditorily to somehow make the best of the impaired

system for retrieving grammatical information from his LTM.

SUMMARY AND CONCLUSION

If memory impairment — especially when retrieval is dysfunctional -— could result in agrammatism, what are the characteristics in terms of clinico-anatomical correlations, on the one hand, and anatomico-behavioral correlations, on the other? Three theoretical constructs may be arrived at here:

First, I postulate that linguistically speaking grammar is a set of conventions governing the usage of the linguistic code that each individual as a social being and a member of his/her language community has acquired over the years throughout the childhood as part of growing up. Thus, I take the view of language-specific grammar and reject the so-called universal grammar. Hence, there is no such thing as universal agrammatism, because agrammatism to me must be language-specific and not universal. Put differently, if a patient is agrammatic, his/her agrammatism can only stem from and be viewed in the light of disorders, disturbances, or even breakdown of the grammar of the language he/she used to speak natively, and not in terms of the violations of any rules in the so-called universal grammar. Since each human language has its own specific grammatical properties that are in some way unique to that language, it follows that an agrammatic patient whose native tongue is Chinese is agrammatic because and only because he/she has lost control of the grammatical properties of Chinese and not of Japanese or English or some other conceivable language.

Second, given the above premise, I wish to state that L.K.'s agrammatism is the effect of the disturbances of his grammatical properties, resulting not so much from the breakdown of the grammatical system stored in his memory capacity as from the inability to retrieve the needed grammatical information therein for modulation.

Third, and finally, I should point out that agrammatism in conduction (i.e., fluent) aphasia is most likely not the same in neurolinguistic terms as that found in other aphasias, say, transcortical (motor) aphasia, where speech may be labored and nonfluent, although the two may share some similarities if grammar as a conceptual system is regarded as being bilaterally represented. The distinction, however, has been designated as sensory agrammatism (or paragrammatism) versus motor agrammatism. I now wish to call this distinction into question and have begun to re-examine the nature of grammar in aphasic speech and its disturbances. When more Chinese data are considered, the distinction may become superfluous.

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Linguistics: An Academic Family of Language Studies

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Just before the horizontal dawn of language, the first linguists pondered and wondered about this great new power whispering ideomorphicaly in human minds. "What did it mean? What would it be? Where would it lead their kind?" Like an artesian well, language flows from a source so deep and dark no eye can see, no hand can reach its origin. In most children this well flows if they live where rain pours.

This well will flow until the last human breath whispers away into nothingness. Its rhythm will always give dance to our feet. Its power will always give imagination to the brain that love imageries. To those who want to know themselves, they must enter through the door of language to their minds, which are the essence of ourselves. A desire to know or to learn will always evoke the inner whispering that gave birth and form to language as well as the power to flow like an artesian well.

Language is nature's mode for guiding the human race into divergency. Language circumvents the gradual process of genetic evolution guided by natural selection and adaptation. Language is the hare that sleeps not in the race for change. While the tortoises plod along, the human race, using the power of language, sweeps them into extinctness. Only microbes that can diverge rapidly into new genetic forms can compete with the power language gives human.

Language is both essential and foundational to cultures that mold and sustain evolving civilizations or the benefits from the accumulation of knowledge. In 1921 Sapir (1949: 3-4) commented on the significance of culture to language. He wrote:

> ...The process of acquiring speech is,...., an utterly different sort of thing from learning how to walk...To put it concisely, walking is an inherent, biological function of man.
>
> Not so in language. It is of course true that in a certain sense the individual is predestined to talk, but that is due entirely to the circumstances that he is born not merely in nature, but in the lap of a society that is certain, reasonably certain to lead him to traditions. Eliminate society and there is every reason to believe that he will learn to walk, if indeed, he survives at all. But it is just

as certain that he will never learn to talk, that is, to communicate ideas according to the traditional system of a particular society.

Sapir recognized the neurological propensity to acquire language in a cultural environment. Piaget (1964), not unlike Sapir, viewed the acquisition of language, as well as cognitive development, to be an interactional process between the environment and one's central nervous system. Chomsky (1968) proposed that language development is basically a neurological unfolding generally and systematic with humans in all speech communities. Oleron (1977) present an excellent comparison and synthesis of the academic positions on language and mental development.

Skinner's (1957) position of the role of society in language development is antipodal to that of Chomsky. Skinner attempts to explain language behavior in terms of operant conditioning, meaning that actions, events and situations exogenous to the learner guides and shapes one's language acquisition. As Rapoport (1975:377) suggests up to a point (this) theory seems plausible." Close scrutiny of children in the process of learning to speak yields data that invalidates both Chomsky and Skinner's views on language development.

Korzybski's (1958) theory of language behavior also included a conditioning process, but only for a point of departure. He believed that acquiring language involved "false-to-fact semantic reactions." A word learned was a conditioned response to what it represents. One allergic to dogs should have the same response to a toy dog or the word dog. Korzybski put the human nervous system in the center of attention in regards to language and its functions. Even if Korzybski did stress classical conditioning in language learning, he, unlike Skinner, theorized about events in the "black box." He thought he could infer the nature of these events, including actual physiochemic events, by observing language behavior.

The nature of language is so encompassing and so essential to human behavior that many different perspectives are required to see its total impact on the human race. For this reason, scholarly perspectives so diverse as those postulated by Korzybski, Chomsky and Skinner may shed a degree of light, even if it is a very narrow band, that helps linguists see language a little more clearly. It is the linguists responsibility to define precisely how broad or how narrow a perspective on language is and what aspect the focus of the perspective is on. While a general linguist may have a perspective, he or she should be open enough intellectually to integrate all the light, regardless how minimal, different perspectives bring to our understanding of language. Linguists must be the rudders to each and all of these perspectives in order to guide them to their most propitious focus on language.

Linguists must always remember that language belongs to human breath and mind, and never to one or more, or even a school of linguists.

The neurologists who study the neuronic function of language as speech production in the brain are as essential to our understanding of some facets of language as more general inquiries are. Many neurolinguists may never see the whole of language due to the myriads of neurons floating in their eyes as they study the mushroom of neurons tht compose the brain. To be essential for our thorough understanding of language, neurologists need not study specifically phonemes, morphemes, syntax, grammar or semantics.

The neurological consequences of brain damage relating to speechlessness have been recognized for at least 5,000 years. Aphasia (Sies, 1982) was described in an hierorglyphic account by an Egyptian named Imhotep in apparently 3000 B.C. Imhotep wrote these details: "...one having a wound in his temple, perforating his temporal bone; while he discharges blood from both his nostrils, he suffers with stiffness in the neck, and he is speechless. An ailment not to be treated." With regards to another case Imhotep commented: "...one having a smash in the temple; he discharges blood from his two nostrils and from his ear; he is speechless and he suffers with stiffness in the neck."

In modern times, beginning in the 1870's, medical experts have given much elucidation on conditions such as those described by Imhotep. The modern pioneers in neurolinguistic research began with Paul Broca 1824-1880, J. H. Jackson 1835-1911, and Carl Wernicke 1848-1905. Research and study of aphasia continues to draw much attention as attested by Jason W. Brown's (1981) book. Jargonaphasia. In the preface of this book Brown wrote:

> This work on jargonaphasia appropriately reflects the interdisciplinary nature of the subject, in that it brings together contributions from linguistics, psychology, speech pathology and neuroscience around a common theme of considerable importance to aphasia study...Yet one of the major factors that has prevented a fuller understanding of jargonaphasia is the poverty of case material on the subject, and the incompleteness of linguistic description...(xiii).

Lesser (1978) recognized the importance of linguistics to the study of language disorders in aphasia too. Lesser summarized this importance by starting two significant contributions of the linguistic approach. They are: 1) recognizing that language has structure, which is often assumed to be hierarchial in nature. This hierarchy is an expression of the basic units of language: phonemes, morphemes, syntax, etc. 2) providing a framework that permits the analysis of the aphasias as a central disorder affecting the ponological, syntactic and semantic levels of function. Riedel (1981:220) described the linguistic approach as

deemphasizing "the traditional dichomoties that referred to a disproportinate impairment in one avenue of input-output processing (e.g., motor-sensory, expressive-receptive, auditory-visual, decoding-encoding)."

In her summary on the significance of linguistic studies in understanding the aphasia Riedel (1981:241-42) concluded:

> At this point in time, some conclusions can be drawn from the extensive investigations of comprehension at each of the various linguistic levels. Using different experimental methods to investigate phonological, semantic and syntactic abilities in aphasia, studies indicate that the large majority of patients have some degree of impairment at all levels, Though impairment may not correlate with the overall severity of comprehension...These findings support the existence of central mechanisms that affect both speech production and comprehension.
>
> It is also clear that the degree of impairment at each level is unequally related to overall comprehension ability. In most studies disturbances at the phonological level seem quite dissociated from overall comprehension ability..., and it may well be that the phonological level operates as a relatively peripheral part of the language system. Disturbances at the semantic level are prevasive among all aphasic subtypes and are also found in individuals suffering brain lesions outside the language areas....
>
> The results of a number of linguistic investigtions suggests that syntactic deficits are common in all aphasic subtypes, although syntactic tests do not adequately differentiate subgroups of aphasia, such tests relliably discriminate non-aphasic braindamaged individuals from aphasics....

Jakobson (1968, 1980) has been most productive in addressing neurolinguistic topics related to aphasia. Neurolinguistics has been and continues to be most productive in the study of neuronic mechanisms for the production of speech and language. Neurolinguistics is mechanistic, meaning that its scope is too narrow to address the psychological, philosophical and social issues of language. The preciseness, that causes the narrowness of neurolinguistics is described well by Damasio's (1981:51) words about the central nervous systems with reference to the nature of aphasia.

> ...The reference to the central nervous system is also important (although it is quite clear that all mental activity and communication stems from the activity of the central nervous system) because aphasia is not the result of peculiar utilization of language related to psychogenic or social deviations. Furthermore, in true aphasia, the CNS disease compromises certain structures in a focal rather than in a generalized

fashion; for example, aphasia is not the result of a widespread cerebral disease but rather the consequences of a concentrated well-targeted insult to the brain.

Benton (1981:18) in reference to neurolinguistics commented, "An important development in recent decades has been a concerted effort to describe in precise terms the alterations of speech shown by aphasic patients and to relate these changes to the anatomic substrate of the disorder as well as to the cognitive status of aphasic patients." Jason Brown (1981:5) argues that speech produced in the psychogenic state of schyzophrenia is "structurally identical" to that of aphasic language. Brown cites studies done by Kleist and others to support this thesis, however, Kleist's work is not given in the reference. But the work of Farkas et al. (1980) is referenced.

The mechanistic approach of neurology to study the brain often yields data and results that support general linguistic premises. Kirk (1983:4) explained well the pitfalls of scholars in one discipline being unaware of insights known to others in a related area. She wrote, "..., when research findings within one area of study are interpreted without reference to insights derived from another area the effect can only be to delimit the understanding that is attained within each domain." Kirk believes research often proceeds along parallel rather than along convergent lines.

Of interest and pertaining to linguistics there are several on going research parallels. Brain research beyond direct language function has much to offer linguists. Tanji's (1980) work with neuronal activity in the cortical supplementary motor area of the brain and Fetz's (1980) study of the functional relations between primate motor cortex cells and forelimb muscles may have significance for linguistics. Fentress (1983) reports how the "grooming syntax" of mice develops along lines similar to that of syntax in children. Studdert-Kennedy (1983:5) cited Lenneberg's (1967:106) statement: "...formal aspects of purely physiological process seem to be similar to certain formal aspects of grammatical process...as if the two, physiology and syntax, were intimately related, one grading into the other..." To support the idea that "...linguistic structure may emerge from and may even be viewed as a special case of motoric structure, the structure of action."

In support of the thesis that language has a foundation in some degree of biological specialization Liberman (1983:8) gives three characteristics that all known spoken languages share: 1) a large, indefinitely extensible vocabulary having articulatery, acoustic mediated, phonological system; 2) a syntactic system having a set of normative principles that govern the form and order of words which are combined in phrase; rules that cannot be characterized by the nature of the concepts such segments are used to express; 3) a mopensity for constant change, which characteristically results in systematic differentiation by sex, class, location, etc. On page 11

Liberman continues his universal descriptions as being: 1) evidence for a syllabic structure having vowel like elements at the center and increasingly nonsonorous toward the periphery; 2) within such structurally defined categories, evidence for the sequence of phonological possibilities into natural classes identified by features such as high/low, front/back and voiced/voiceless. In the final analysis Liberman along with Studdert-Kennedy, and Lenneberg and most of the contributors to the volume, Psychobiology and Language, which is edited by Studdet-Kennedy, argue for or postulate that the neurological competence for language can be neuronically and genetically traced to principles governing the organization of behavior in general. This is not a Chomskyan posture of the language acquisition device universal to all humans. These scholars do not deemphasize the contributions of the child's caretakers and the speech community as Chomsky did. They are more in line with Piaget in the sense that the whole human organism is considered. Zyph (1968) is their predecessor.

Macphail (1982:340) states best the view neurologists and psychobiologists hold towards Chomsky's thesis concerning an innate language acquisition device. His words on this topic are: "The proposal that humans possess a species specific language-acquisition device stands, then, on its own as it gains no positive support from phylogenetic considerations, from behaviorly studies fo memory organization, or from brain studies." However, Macphail does accept the possibility that humans may possess a device that allows the acquisition of language, or is language-specific. He believes this may be the case due to its being parsimonious.

Brain studies reveal why language is dynamic and not static, permitting divergency in thought to occur rather than convergency. Language is dynamic because the brain is a vigorous organ that retains its power by having neuronal plasticity. Thompson et al. (1978:85) wrote: "..., many neurons in the brain possess plasticity, the property of changing their activity as a result of past activity or 'experience'." Lynch and Wells (1978:105-6) summarized the results by brain research in these words:

> "..., there is a considerable body of evidence which shows that the constituents of the brain, the neurons and glia, possess considerable capacity for growth, even in the adult brain. These results suggest a picture of an ever changing brain capable of growing new circuitry rather than a static structure which simply modifies the strength of its embryologically defined wiring patterns..."

Through the mechanistic study of the brain we have learned why language is dynamic. Through such research we are learning how bilingualism and multilingualism affect the neurons of the brain (Alber and Obler, 1978). Summarizing the results of brain results related to bilingualism Albert and Obler (1978:253-54) wrote: "..., it would appear that learning a second language distinguishes

the bilingual from the monolingual not only in language skills, but also in perceptional strategies and even in patterns of cerebral organization..."

Albert and Obler reviewed three consequences that became apparent due to the study of the bilingual brain. 1) It is no longer correct to accept the dogma that the left hemisphere is necessarily dominant for languages in right-handers. Evidence from studies of bilingualism suggests that the brain can remain plastic throughout life as environmental stimuli, such as education, impinge upon it. Patterns of cerebral organization for language must change throughout life. 2) Knowledge that cerebral organization for language differs for bilinguals and monolinguals may be useful therapeutically. Aphasics who do not recover their first language may be taught a second language. The stimulation of the right hemisphere might serve as a "deblocking" technique to facilitate recovery of the patient's usual language. 3) If it is true that the right hemisphere plays a major role in the acquisitions of a second language, at any age, then it might be useful to develop a program of second language teaching that emphasizes so-called "right hemisphere strategies." For example a second language might be more easily learned if it were taught through nursery rhymes, music, dance, or techniques emphasizing visuospatial skills.

There is one more area of study that is most germane to general linguistics. It is that of artificial intelligence. Gleason (1965:12) pointed to the problems those who seek to create artificial intelligence face when he wrote, "One of the greatest shortcomings of descriptive work with the expression aspect of language has been a lack of understanding of the relationship between expression and content, and the inability to use the analysis of content in attacking related problems in expression. Here is the great frontier in linguistic knowledge on which we may look for progress in the next decades." As late as 1980 Roman Jakobson (1980:38) expressed concern indirectly about this issue. He stated, "Two sets of questions are brought up by the progressing neurolinguistic research: first, the inter-hemispheric topics demand an ever closer linguistic, or to put it more exhaustively, semiotic approach; and secondly, we face a consistently interdisciplinary study of aphasic problems in connection with a difference in the affected zones of the left hemisphere.

At the time Gleason was expressing the shortcomings of linguistics in the area of content analysis, scholars interested in creating artificial intelligence were attempting to enter this great frontier. Wall after wall have kept their tracks from entering deeply into this frontier. By the time Jakobson had called for more research in the semiotic approach, great thinkers in the search for artificial intelligence had already been defeated or converted from one approach to another because no way to create true artificial intelligence had been found. For an enjoyable and readable account of the search for a way to create artificial intelligence

see Artificial Intelligence published in 1986 by the editors of Time-Life Books. When artificial intelligence is truely created, the problems between expression and content will have almost been resolved.

Linguistics is an academic family of language studies. Every member of the family is important if we are to enter the great frontier Gleason believes must be conquered before the human destiny in language is achieved. Luria (1977:73-74) described how language is used to make the brain an organ of freedom. He built his knowledge upon the foundation Vygotsky (1962) laid down in Thought and Language. While Luria's interpretation of the brain being an organ of freedom may be accepted by totalitarian rulers as evidence that eveyone can command his or her brain to see absolute truths in a political and economic theory, I see language as a natural process assuring diversity. If language forces all to converge or agree, then it negates the need for intelligence. Language does not negate the need for intelligence. It makes the full blooming of intelligence possible. Language calls our attention to divergencies so we may see beauty. Language gives us the power to use our intelligence to generate divergent, linguistic and artistic patterns and structures in order for us to be creators of beauty. For this reason, we should study language from all perspectives.

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IX

HISTORICAL STUDIES

THE ROMANCE AND INDO-EUROPEAN MODELS OF COMPARATIVE LINGUISTICS

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The comparative method serves both to bring out the specific correspondences between manifestly cognate languages and to test the validity of questionable or distant relationships. It has been used most voluminously and prestigiously in one major family, the Indo-European, with emphasis on the more ancient stages in each branch; for example, classical Greek -- not Byzantine or modern -- and above all, the archaic features preserved by one or another of the classical dialects; or in the Germanic branch, emphasis on Gothic, Old English, Old Norse, Old High German. The principle is that whatever is shared by distinct but related languages has come from the time when their forerunners were one speech-community, or from subsequent developments which embraced all parts of that erstwhile community, or at any rate more than one part. Accordingly, divergence -- much more than convergence -- has prevailed in the evolution of languages, except (of course) that often, in particular circumstances, one dominant language of a region has tended to supplant all the rest.

These were reasonable conclusions from a great deal of fruitful research in the nineteenth century. It was indeed so successful that the limitations of this method got lost from sight. Reconstruction of prehistoric Indo-European became more and more the main focus; for it gained in precision and credibility as further data were brought in. For instance, early in that century Sanskrit was taken to be the most conservative of the whole family, not only in general but in most details, including Ablaut: whereas in the European languages, most clearly in Greek, the front-vowel *e* contrasts with the back-vowel *o* as in ἔφερον 'I carried', Sanskrit instead of both has the neutral vowel [ʌ] -- अभरम् {ábharam}[1] -- and this was thought to be the primeval sound. But in 1879 Collitz showed that the [ʌ] in {ca} 'and' as well as several other words must go back to a front-vowel like what is preserved in Greek τε, Latin *-que*, but that on the other hand the [ʌ] in the first syllable of {katarás} 'which of two, whether' must be from a back-vowel as in Greek πότερος; for otherwise the difference, within Sanskrit, between the palatal consonant {c} and the non-palatal {k} would be inexplicable.[2]

A prehistoric, ancestral form was reconstructed to be the starting point from which the recorded forms in the several languages developed, by regular, credible changes, no more complicated than the diversity of the facts required. As linguistic science advanced, the reconstructed forms that gained acceptance

by the profession grew more and more probable, even to the point of being regarded as virtually on a par with historical truth. Although the asterisk was introduced to mark the hypothetical quality of **ébherom*, **k̑oterós*, etc., nevertheless proto-Indo-European as a whole passed and still passes for a real language of 5000 or 6000 or 7000 or 8000 years ago.

Only in a figurative sense is a language reconstructed; and at that it is not like rebuilding a collapsed house whose former state is definitely known from photographs, plans, a scale-model, or accurate memory. Rather a linguistic reconstruction is somewhat like an archaeologist's reconstruction -- on paper -- of a ruined ancient building from the remains of the floor, some bricks or stones that once formed part of the walls, and one or two roof-tiles. Unless a clear description is also extant, the best that can be claimed for the reconstruction is that it stands *exempli gratia*, to give us an idea of how the building looked. The archaeological reconstruction must be in line with the evidence; but the evidence, inescapably, is too little to determine the plans that would be needed for a veritable reconstruction.

In the nineteenth century, when the German scholars utterly dominated comparative studies, proto-Indo-European or *die indogermanische Ursprache* was conceived in fairly simple terms, as existing in some particular -- if not datable -- prehistoric era, and at a particular early stage of development before the emergence of those characteristics that distinguish the recorded ancient languages from one another. Anything still earlier than that stage was irrelevant. For in accord with Ferdinand de Saussure's famous simile of the chess game: at any given point in the sequence, how it came about does not matter; the relations, either between the chessmen or between the elements of the language are what they are, and upon them, no longer upon anything previous, depends any subsequent change.[3]

But to us, what would be called -- in our current terminology -- a synchronic description of proto-Indo-European seems inadequate for the purpose of explaining the subsequent historical facts. Especially since Hittite was brought into the picture, around 1920, it has become customary -- and perhaps necessary -- to attempt a reconstruction of successive stages of prehistoric Indo-European. The theory of the laryngeal consonants, more than anything else, is complex and controversial; but that is not all. Whereas some parts of the nineteenth-century reconstructions have been refuted -- or at any rate laid aside permanently, to all appearances -- the rest now consists of alternative possibilities much more than definitive results. We are closer to the truth of the lost past, but rather in a negative sense: less bemused by plausible hypotheses.

The challenge of reconstructing *Urindogermanisch* attracted the best minds for more than a few decades, and what they accomplished was esteemed a great discovery, a momentous advance nearly or quite on a par with the decipherment of Egyptian hieroglyphics or Babylonian and Assyrian cuneiform. The Indo-European-

ists had indeed a specious advantage over the Egyptologists and Assyriologists: their line of reasoning could be followed and appreciated by a larger learned public, knowing Greek and Latin along with a little Sanskrit perhaps or Gothic. Prehistoric Indo-European grammar was easy to grasp, because it is so much like the grammar that those people already knew; it was necessarily based on a comparison of similar and more or less familiar languages. The deciphered languages, on the other hand, no matter how cogently presented, were then and are still alien and very difficult, full of perplexities.

Through a paradox, linguistic science was nearly identified with reconstruction of the prehistoric. The paradox can be clarified if we turn to the method of comparing the Romance languages, which was worked out somewhat unobtrusively around the same time. In that field, since the first scientific studies it has been clear that the vernacular languages of medieval and modern times grew out of Latin, an ancient language which -- for practical purposes -- is fully documented; not, to be sure, its entire vocabulary, but what can be added supplementarily to Latin through comparison of the Romance languages is minute. The simple statement that those languages developed from Latin needed one important qualification, expressed by the adjective "Vulgar" -- i.e. from the Latin spoken by ordinary people. The best formulation of this concept remains in dispute to some degree; but what seems to me settled is the opposite term: The Latin from which the Romance languages developed was not the same as classical Latin, that register or level which was cultivated by the writers of the "golden age" (in the first century B.C.) and the "silver age" (in the next century or so).[4] Classical Latin, furthermore, went on being taught in schools -- though with some changes, chiefly phonetic -- even after there was no longer an educated upper class speaking it at home; its grammar was formulated very systematically so as to be learned by drill as well as practice.

Classical Latin was the Latin that the linguistic researchers knew best; so it took no little labor to come to grips with many details in Romance linguistics that are better explained by going back to the deviations from the classical standard, deviations documented now and then in the ancient sources but much less copiously. Some Romance forms even have a Latin source antedating the establishment of that standard. The Italian *meno* 'less', for instance, used to be considered a derivative from Latin *minus*, as the Spanish *menos* is, but with the loss of the final *-s* in Italian. More accurate study, however, brings out that in pre-classical Latin forms without the *-s* were frequent, as many inscriptions prove[5] -- besides the meter of the poets, among them Ennius and Plautus around 200 B.C., Terence half a century later, and even Lucretius around 60 B.C., who had a taste for the old-fashioned.[6] His eminent contemporary Cicero remarks outright that dropping the *-s* "iam subrusticum uidetur, olim autem politius . . . sic enim loquebamur" ('it now seems a bit boorish, but formerly was more refined; for that is how we used to speak').[7]

His words *iam subrūsticum* show there were uncouth people still speaking that way. This is Cicero's plain meaning, though some have written at great length to get around it.[8] It is gratuitous to suppose that those people, or their uncouth descendants such as the ones who scribbled *MAGI* and *MELIV* and *CVLV* and *COCV* on a post or a wall in Pompeii, ever went over to the classical rule of uniformly pronouncing the final *-s*.[9] Instead, as the Romance vernacular developed in Italy, the Latin forms without *-s* were preserved while the alternate ones with *-s* went totally out of use there.

Besides the broad influence of classical Latin grammar on education and on ideas about language in general, there seems to be something inherently simpler -- though not truer -- in positing originally a final *-s*, rather than an alternation between *-s* and a weaker consonant or none. For in the history of very many languages, perhaps all languages, the loss of this or that sound is a frequent phenomenon. If the Latin that was the source of the Romance languages had had at the outset a uniform *-s*, some of them might well have lost it. Consider that the Latin *-s* that persisted in Old French has since become silent, except for some noteworthy vestiges such as *fils* [fis] 'son' (< *fīlius*, nominative singular, and *fīliōs*, accusative plural) or *moins ivre* [mwẽzivʀ] 'less drunk' (< *minus ēbrium* masculine, *minus ēbria(m)* feminine). But the essential point, on the issue of method, is that we have plenty of clear data showing the alternation between *-s* and no consonant in the Latin of Italy before and during the Christian era, unlike Spain, Gaul, and elsewhere. That ought to take precedence over any theory.[10]

To be sure, thanks to the enormous prestige of the reconstructed proto-Indo-European, some scholars have seen fit to reconstruct and describe a proto-Romance parent language. In effect, or even by definition, it amounts to what there was in Latin that has gone into the Romance languages.[11] Aiming first at phonetic accuracy, it looks almost like Latin but spelled a little differently: the [k] sound is written **k* instead of *c* or *q*; instead of *x*, the digraph **ks*.[12] Ideally, proto-Romance is what could be reconstructed from the Romance data if the knowledge of Latin had been lost; but it would have taken immense powers of divination, not just deduction, to reconstruct the pertinent features of the source language as they really were.

Let's take the case-endings of nouns, adjectives, and pronouns. Interesting vestiges remain in some Romance languages,[13] although much the greater part of that system was abandoned throughout Romance. Knowing Latin we perceive, for instance, that certain place-names of Italy -- *Firenze, Chiusi, Rimini*, etc. -- are from the Latin locative form *(Flōrentiae, Clūsī, Arīminī)*; but without Latin texts to read or a Latin grammar to study, how could we identify the locative function of that final vowel? The ancient meaning was 'in so-and-so'; but from the Romance evidence we could scarcely make out that it had been 'in' rather than 'to' or 'from'. We might well suspect, though, that in proto-Romance the ending -- whatever its precise function

might be -- was mainly limited to names of towns. That is so in Latin; and the few common nouns used locatively -- *domī* 'at home', *humī* 'on the ground', *rūrī* 'in the country' -- did not survive in Romance.[14]

Besides the mere vestigial preservation in Romance of some major Latin morphology, there was other important Latin morphology that died out completely. All verb-forms with passive endings ceased to be used. The Latin perfect passive participle survived mainly by being adapted to perfect active or stative constructions. The Latin future active was totally replaced by a compound of the infinitive + the reflex of *habeŏ* 'I have', *habēs* 'you have', etc.[15] It has been reasonably theorized that throughout Italy and many provinces of the Roman empire a sort of creolized Latin, spoken though seldom or never written, was in widespread use alongside of standard Latin but lacked certain prominent characteristics of standard Latin. That it was in fact so, is neither proved nor disproved. Therefore we have a sound methodological argument for calling such a creolization "proto-Romance" -- its deviations, negative as well as positive, from standard Latin being inferred from the Romance languages in the centuries after the empire collapsed.

The theory, properly formulated, would not posit that no speakers of the creole were able to avail themselves of standard Latin or something close to it when the social situation required it of them. For in modern times -- e.g. in Haiti or Guyana -- quite a few creole speakers are observed to have a considerable range of registers, even reaching up to standard French or English.[16] But what makes a creole important in the long run is that the speakers use it at home and thus pass it on to their children. Anyhow the degree of creolization of Latin in proto-Romance should not be exaggerated. With due allowance for the losses, still a lot of the Latin verb-inflection remains in Romance -- much more indeed than any modern creole has kept from its source-language.

What does the historical origin of the Romance languages suggest about the prehistoric origin of other languages related to one another? Not, of course, that the political or social circumstances were similar, except in the most general way: a former community of some sort disintegrating. No prehistoric source-language is likely to have been so standardized as classical Latin, which (as we have remarked) was somewhat different from the Latin that the Romance languages go back to. While it would be absurd to posit that no prehistoric language developed an oral literature and with it a strict standard of usage, still we can scarcely suppose that such a literary language ever became the starting point for a group of divergent vernacular dialects.

The Latin and Romance model has some immediate relevance to proto-Indo-European. If we aim realistically at something plausible, we should posit a <u>variable</u> rather than a uniform proto-language. On the very point of the final *-s*, here is a lesson to apply from Latin and Romance: Although certain Indo-European languages show *-s* uniformly -- namely Greek (in nearly all dia-

lects), classical Latin (but not pre-classical), Gothic, Lithuanian -- the others do not.[17] The Sanskrit and Avestan cognates to this sibilant are highly varied: in Sanskrit the {-s} appears only if the next word begins with {t-} or {th-}; in Avestan not even then. In this regard the early Indo-Europeanists, as well as the later ones, did not make Sanskrit their model for prehistoric Indo-European. Instead, contrary to the practice of the Hindu grammarians, they would cite the Sanskrit words as ending in *-s* -- i.e. the infrequent combinatory form; for that was what they supposed Sanskrit to have preserved from the *Ursprache*.[18] It is time for us to reconsider this, and to acknowledge that the variability of the Sanskrit sounds in that final position is probably close to the ancestral state. For this variability is definitely established in the earliest texts, which -- being priestly chants -- are far more likely to be conservative than innovative in their pronunciation.

If for convenience we continue to write "pIE **-s*", anyhow we should make it understood that the letter, accompanied by the asterisk, stands for various sounds related to [s]. We should not just take for granted that everyone who knows enough to read about comparative grammar is already aware of the phonetic imprecision inherent in reconstructed forms, even though they may look straightforward and simple.

The comparative method, as practiced in the Romance field, is most firmly grounded in facts and therefore has arrived at the surest, most trustworthy conclusions. By an easy corollary this would seem the best model for all comparative linguistics -- were it not that in few other areas is there anything like Latin, a well recorded language from the past to be treated as the source of certain modern languages. The more amenable groups are the Indic, descended from something like pre-classical Sanskrit, and the Arabic, descended from the language of early Islam.[19] In China the related but distinct languages that half-informed foreigners have lumped together under one name -- Chinese -- may indeed have a recorded ancestor in the pre-Christian era; but the traditional writing system hides the sounds rather than revealing them; so it is extraordinarily hard to trace the development.

Where no ancestral language is preserved, there would appear to be no choice but to proceed as the Indo-Europeanists do. However, the results -- at best -- will lack factual confirmation. That is a grave limitation; and if it cannot be transcended, it should at least be recognised by the Indo-Europeanists themselves and by all who engage in comparative linguistics.

NOTES

[1]The phonetic symbol ʌ was not yet invented. The letter *a*, properly standing for a wide-open vowel, was applied somewhat catachrestically to this mid-vowel, with considerable risk of confusion. I use braces { } for a transliteration, [ ] for an exact phonetic interpretation.

[2]"Die entstehung der indoiranischen palatalreihe," *Beiträge zur*

Kunde der indogermanischen Sprachen, ed. Adalbert Bezzenberger, 3 (1879), 177-234, esp. 197-199.

[3]*Cours de linguistique générale*, part 1, ch. 3, §4. Strictly speaking, the past state of the language is not altogether irrelevant to the present usage. In every language that has been thoroughly described, an old-fashioned style or register remains more or less familiar, and is used with awareness of harking back to the past. For that matter, no real chess game consists of such discontinuous moves, as though a new player came to the board each time and never communicated with his predecessor. On the contrary, only the least skilled players, without any strategy, consider their moves just one at a time. To win in a good match, you must plan a whole series of moves.

[4]Outside the consensus is Witold Mańczak, *Le latin classique, langue romane commune* (Wrocław: PAM, 1977). He rightly criticizes many excesses of the "Vulgar Latin" theory, but some Latin archaisms in Romance resist his attack; Robert A. Hall, Jr., *Proto-Romance Morphology* (Amsterdam: John Benjamins, 1983), p. 5.

[5]Examples indexed in *Corpus inscriptionum Latinarum*, I (2d ed.; Berlin: G. Reimer, 1918), 817-819. The material is so extensive and varied that it is hard to comprehend. Mańczak, "*S* final en latin archaïque," *Studii si cercetari lingvistice*, 26 (1975), 522-524, focusing entirely on the nominative singular ending of the second declension, was misled by the listings in this index to the conclusion that *-o* instead of *-os* in archaic Latin was limited to names of men and arose by analogy to the *-ō* cognomina of the third declension such as *Catō*. The texts with *-o*, which he apparently did not take the time to look up (he is under the misapprehension that *Oeuo* occurs 18 times, *Taseio* 36 times, etc.), are very brief -- gravestones, dedications, etc. -- and of such a sort that no common nouns or adjectives, or very few, can be expected. From M·FOVRIO·C·F·TRIBVNOS / MILITARE (I^2.48, 49), which if spelled out in classical orthography would be *Mārcus Fūrius Gāī fīlius tribūnus mīlitāris*, we should not argue that *tribūnŏ* and *tribūnŭ*, though they happen to be unrecorded, did not exist in the language. For PATRONV (1257), CASTV (1259), LECTV (1990, twice) are recorded, besides quite a few in other declensions: AIDILE for *aedīlis* (22; like MILITARE, nominative singular) and *aedīlēs* (2442, 2443, nom. plural), REGE for *rēgis* (1334, genitive sing.), PLEBE for *plēbēs* (2659, nom. sing.). Eric A. Hamp, "Final *-s* in Latin," *Classical Philology*, 54 (1959), 165-172, also builds his argument on an unwarranted premise: "*-*u* does not occur" (p. 166), "final *-u* is virtually unattested" (p. 169), perhaps through a misunderstanding of his main authority, Carola Proskauer, *Das auslautende -s auf den lateinischen Inschriften* (Strassburg: Trübner, 1910).

[6]E.g., *et cita cum tremulis anus attulit ārtŭbŭs lumen* (Enn. *Ann.* 35 Vahlen); *nōn mĭnŭs quam uostrum quiuis formidat malum* (Pl. *Am.* 27); *si illum mĭnus nōrat; quippe homo iam grandior* (Ter. *Ph.* 367); *quōmĭnŭs quo missum est ueniat finique locet se* (Lucr. 1. 978). Though the mss. show the *s*, the meter calls for a short syllable, ending in a vowel.

[7]*Orator* 48 (161). We are warranted in inferring that the decisive influence in favor of the *-s* was the Greek education of the Roman upper class. For classical Greek, while allowing the elision of certain final vowels, did not drop this consonant; and as the model of literary elegance, it suggested to the Romans what sort of latitude in pronunciation was euphonious, and what sort was not.

[8]The fullest effort is by Walter Belardi, "Di una notizia di Cicerone *(Orator 161)* su *-s* finale latino," *Studi in onore di Alfredo Schiaffini = Rivista di cultura classica e medioevale,* 7 (1965), 114-142.

[9]*CIL* 4.5092, 5095, 5252, 5570. One wall-painting has in the lower right corner a graffito *FILIVS SALAX / QVD TV MVLIERO / RVM DIFVTVISTI* and in the lower left with better lettering FILIV QVOD TV (4.5213). This shows confusion in the genitive plural, *mulier* (although feminine) being put into the second declension, and the nominative in *-us* of that declension is encroaching upon the vocative function; *filiu* may have been intended, however ineptly, to correct that mistake. Also *quod* (probably pronounced [kud]) is confounded with *quot.*

[10]I am not committed to W. v. Wartburg's theory that the loss of *-s* in Rumanian was due to the colonization of Dacia by less educated settlers than those in the western provinces; see "Die Ausgliederung der romanischen Sprachräume," *Zeitschrift für romanische Philologie,* 56 (1936), 3-5.

[11]See Hall, above (note 4), pp. 5-6, and *Proto-Romance Phonology* (New York: Elsevier [1976]), pp. 177-178.

[12]Some among the ancients realized that in regard to the consonant which we describe as a velar unvoiced stop (or plosive) and symbolize [k] the Latin alphabet was clumsy and redundant; e.g. Quintilian 1.4.9. The subsequent palatalization of this sound before a front-vowel, in most of the Romance area, has further troubled the orthography of the Romance languages and others. For the purposes of linguistic science no one would commend the Latin or Romance model on this matter of spelling. The International Phonetic Alphabet, for example, while based on the Latin, has seized upon the unambiguous symbol [k] for this nearly universal sound but applied [c, q, x] to other, rarer sounds.

[13]See Hall (above, note 4), pp. 15-46 passim.

[14]Apart from the locative, *domu(s)* 'house' (especially a rich man's town house) did survive in Italian with a Christian application: *duomo* 'cathedral'.

[15]One anomalous Latin future *erŏ* 'I will be', etc., persisted into Old French as *ier,* but then gave way to *serai* < *sedēre* 'to sit' + *habeŏ.*

[16]See Derek Bickerton, *Dynamics of a Creole System* (Cambridge University Press, 1975), passim.

[17]In Hittite the true pronunciation of what is transliterated {-š} is beyond our reach; no doubt it was some kind of sibilant.

[18]In normal Devanāgarī writing there is no occasion for the clumsy final character स्, which the Occidental grammars of Sanskrit have made familiar; e.g. वृकस् {vṛ́kas} 'wolf'. It is

rather a transliteration of our *-s* than vice versa.

[19]See Kees Versteegh, *Pidginization and Creolization: The Case of Arabic* (Amsterdam: John Benjamins, 1984).

A VIEW OF IDIOM FORMATION*

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I. General Remarks

I pointed out in my book (1983:312) that most 'verb+noun+preposition' (VNP) idioms (e.g. take advantage of) are of modern making, i.e. from the 16th century onwards. I, therefore, have been tempted to examine the development of the idioms from the 16th to the 19th century, eventually leading up to the present, and to find out some regular processes in the formation of the VNP idioms.

Of various factors that have promoted the development of idiomaticity in the VNP sequences, I have paid special attention to the so-called 're-analysis' caused mainly by semantic changes from literal to metaphorical.[1)]

II. Data and Examples

I have chosen five works for each century (see the data and abbreviations in the references). Most of them are essays and novels. I have also relied heavily on the citations in the Oxford English Dictionary. In what follows, I will touch on those idioms that occurred in my corpus or are cited in the OED and that seem to be more or less related to my VNP idioms.

1) Bear the brunt of

Brunt meant "an assault, charge, onset, violent attack" (OED). This took on an abstract sense "shock, violence of any (im)material force" (OED). In the context of 'the brunt of _', enemy, war and army were used. In the process of idiomaticisation, other constituents such as displeasure, disease and wit came into use.

2) Bear witness to

This idiom had such variants as

(a) bear witness of
(b) bear witness Ø

The last variant, furthermore, allows the insertion of a pronoun as in

(a) In seeking just occasion to provoke The Philistine ...
Thou never was remiss, I bear thee witness.
(OED 1671 Milton Samson 239)

Preposition deletion takes place, when witness is modified as in

(b) Doe not bear false witness, Honor thy Father ...
(H:622)

3) Dance attendance on

After was also used for on before, but modern usage permits the latter preposition only. The preposition, however, is not required.

(a) I will make him sue and serue, and daunce attendance after me ...

(D:156)

4) Find fault with

Against was used for with. The stability of with seems late. This phrase has often been used without the preposition, but with some modifiers, sometimes in the plural. This shows that the status of nouniness was high:

(a) ... which hath in their time borne great reuerence to the church of God ... found great fault against y decrees ...

(D:283)

5) Get rid of

This phrase is not a VNP idiom. Rid is a past participle. For this reason, be was formerly used, as is natural with a passive construction. The peculiarity of this phrase is that rid seems to have been taken for a noun, and sometimes it is possible to make the passive of the NP be got rid of (see Visser§1986, OED 3d.). At the same time somewhere along the line a change in meaning took place: i.e. "be rid of" means "be disburdened of", and this was replaced by the new dynamic passive "get rid of" meaning "rid myself of".The modern meaning developed after this change. The replacement of be by get was promoted along the process of change from staticness to dynamicness in the English language (see my later discussion).

6) Give NP to

In the process of idiomaticisation of this type of phrase, the status of the NP changed from literal to metaphorical. 'Give' class idioms seem to have undergone a transformation as follows:

give NP' NP''(literal) = $\underbrace{\text{give NP''(metaphorical) to}}_{\text{VP}}$

(a) Oh, where shall I find words to give a vent to that excess of ecstasy with which I am overwhelmed.

(Four:213)

(b) ... who gave the rise to the present greatness of the French ?

(D:202)

Give rise to began to be frequent from the 18th on (OED gives a 1705 citation).

7) Keep company with

This phrase was often and still is used in the following construction with/without a modifier:

keep+pronoun+(modifier)company

(a) May I keep you company ?

Bear frequently replaced keep in this context, and also in the context as follows:

bear company to NP

(a) Any man that comes under the name of a soldier and a good fellow, you will sit and bear company to the last post.

(N:257)

In my data, Deloney (7 examples) often used bear NP company. Bear company to was used by Nashe only once.

Keep company with, in this respect, was a late combination, though this phrase appeared in the 16th.

8) Lay claim to

Make (a) claim to was used in the 16th as in

(a) ... of whose coming when King Henrie vnderstood, knowing hee would make a claime to the crowne ...

(D:214)

9) Lay (one's) hands on

The modifier was mostly 'violent' with the phrase lay hands on (see OED "lay" 21:c) as in

(a) ... they laid violent hands on her and ...

(S:766)

Lay (violent) hands on requires a human object, and lay one's hands on requires an inanimate object:

(a) The soldiers laid (violent) hands on the women.

(b) I don't know where to lay my hands on that kind of book.

10) Lose sight of

This form appeared in the 18th. This idiom must have been analysed in earlier times as follows (cf. 'lose - from sight', 'be lost to sight'):

lose | the sight of NP

⇓ the deletion

lose sight of | NP

The evidence for this analysis is provided by the following citations:

(a) ... so that they that were behind lost the sight of him that went before.

(Bun:150)

(b) They loste ye syght of ye castell, it was clene vanysshyd away.

(OED a1533 LD. Berners Huon xxiii 68)

Before this re-analysis took place, there was no strong unity between the verb and the noun, and therefore some other verbs such as have and take appeared. This kind of re-analysis operated on other 'V+ØN+P' patterns such as make use of and take advantage of.

11) Make + (a) + N + of

This pattern has been very productive, and many non-idiomatic phrases have been produced as follows:

(a) ... now shalt thou see a silly woman scorn death at his teeth, and make as small account of his cruelty ...
(b) ... if he be one that makes conscience of his duty ...
(D:31)
(c) ... the person who had expressed so much concern with a commission to make a purchase of her ...
(Four:211-2)

OED (18.) cites many examples of this pattern.

12) Make mention of/make use of

These two idioms have something in common. Their frequency is high both in the active and passive forms. They are often accompanied by modifiers. Make mention of is an expression borrowed from the French expression faire mention de (OED), and therefore has been used from the beginning of the 14th up to the present in its entirety. The lexical status of use in make use of (cf. French faire usage de) was apparent from 16th to 18th and still is today in some cases:

(a) I shall make honourable Mention of their Names in a short Preface.
(OED 1738)
(b) Gross plodders they were all that had some learning and reading, but no wit to make use of it.
(N:296)

13) Put an end to

This phrase had some rival forms such as make an end of and put a period to (see OED). Both enjoyed their popularity until the 17th.

(a) ... while Apollyon was fetching of his last blow thereby to make a full end of this good man ...
(Bun:93-4)
(b) ... on Tuesday last his Majesty was pleased to put a period to this Session of Paliament.
(M:41)

14) Put a stop to

This phrase also had rival forms such as give a stop to and make a stop of. They were used until the 17th.

(a) ... the shutting up of houses was no way to be depended upon as a sufficient method for putting a stop to the infection.
(D:180)

15) Set fire to

Set NP on fire was used more frequently before with the same meaning as set fire to.

(a) That is (answered the Princesse) where contention setteth the house on fire ...
(D:96)

16) Set foot on

Foot was accompanied by one's and/or a modifier. This implies its literal sense. The preposition differs according to where one sets one's foot.

(a) Lady Sm. Mr. Neveront, your Handkerchief's fallen. Miss. Let him set his Foot upon it, that it mayn't fly in his Face.

(SW:66)

17) Take advantage of

This phrase took several centuries to become a complete idiom. While its lexical status was still apparent on its way to idiomaticity, it took (in)definite articles, or its relativisation was possible:

(a) But I will not on this occasion, take the advantage of the great number ...

(D:65)

(b) We complained of advantages which the men took of our youth ...

(SM:297)

The meaning of this phrase, as the above examples show, was rather literal in the sense of "use to one's own advantage", and the other meaning "exploit" seems to have developed later.

18) Take care of

This phrase began to be frequent from the 17th on. Have (a) care of was prevalent in the 16th as follows:

(a) ... I perceiue you have a care of your bonds.

(D:209)

(b) It is surely the spirit appointed to have care of me which doth now ...

(S:634)

19) Take heed of

This phrase was often used without the preposition of. In Bunyan, to was frequently substituted for of. This 'blending' probably came from the meaning of heed 'regard, attention', on the model of which the idiom pay heed to was created. Good was a favourable adjective for heed.

(a) ... wherefore take good heed to what I have showed thee ...

(Bun:61)

(b) ... the pillar that Christian erected for a caution to pilgrims that came after to take heed of entering into the grounds.

(Bun:341)

20) Take hold of

On was sometimes used for of, and still is in America. At the same time, a and a modifier were accompanied by hold. Have a hold of often has a literal sense:

(a) Tom ... took hold of the Bell and ...

(D:188)

(b) ... caution must be taken that men have a good stay and hold of themselves ...

(B:193)

21) Take leave of

This idiom has other variants:

(a) take one's leave = depart
(b) take (one's) leave of = say goodbye to and depart
(c) take leave of = (fig.) throw away (one's senses)

The first two forms were prevalent in the 16th and 17th. Take leave of came into frequent use after the 18th, and is also used figuratively nowadays:

(a) ... there passed not many days ere the now fully recomforted Dorus ... took leave of his master Dometas's husbandry to follow her.
(S:625)

(b) ... wherefore taking gently her leaue of him, she thus began to mediate on the matter ...
(D:157)

22) Take notice of

This phrase came into frequent use from the 17th on. The passive has been frequent with a modifier:

(a) ... who came into her house none took notice of.
(N:301)

(b) The bounds of that Power ... are to be taken notice of, from two things.
(H:275)

23) Take part in

Against was often collocated with take part in the sense of 'take side'. The different meanings take part in and take part against probably came from the French ready-made expressions 'prendre parti contre' and 'prendre part a' respectively.

(a) The Master of the Mint, our whilom refresher and consolation, now took part against us ...
(N:304)

(b) For the Rabble of all Nations do always Naturally take Part against themselves ...
(B:51)

24) Take (a) pride in

This phrase also took 'to-infinitive' complements as in

(a) This mortality first began amongst old men, for they, taking a pride to have their breasts losse basted with tedious beards ...
(N:275)

Take delight also takes both gerund and to-infinitive complements as in

(a) ... the delight she took in loving him.
(Four:167)

(b) ... he taketh delight to multiply pardon to offences.
(Bun:225)

25) Turn one's back on

The passive without the preposition has been frequent up to present. The meaning of the phrase with or without to is only literal. The phrase turn one's back on, on the other hand, is used figuratively. The latter collocation seems to have appeared later (OED cites a 19th example).

The following examples which occurred in my corpus are all literal:

(a) ... straight after his back was turned, I went in all love and kindness to the Marshal General of the field ...
(N:267)

(b) All those that have taken arms for the prince's safety, let them turn their back to the gate ...
(S:387)

III. Some possible explanations for changes in VNP idioms

It seems possible to set up four stages by which an expression may become idiomaticised.

At the first stage, all the constituents in an idiom are unrestricted in their relation with each other, and only grammatically restricted as in

$$\underbrace{\underset{V}{\underline{\text{put}}}\ \underset{NP^1}{\underline{\text{the book}}}\ \underset{P}{\underline{\text{on}}}\ \underset{NP^2}{\underline{\text{the table}}}}_{\text{no grammatical restriction}}$$

The NP^1 is quite free, i.e. determiners or modifiers may be attached to it, or it may be used in the plural. The verb is replaceable.

At the second stage, the relation between the verb and NP^1 comes to be stabilised. Each expects the other. For instance, in the following contexts

(1) V fault P NP
(2) V the sight of NP

find is preferred in (1), but the preposition is still unfixed. In (2), lose is preferred, but some other verbs are also possible. Then the verbs begin to impose certain restrictions first on the nouns, and then on the prepositions. In the first place, noun features such as determiner/modifier attachment, and number change are thrown off, and the prepositions become more fixed.

At the third stage, the process of idiomaticisation goes further, and 're-analysis'[2] takes place, readying the phrases for frozenness. In (2), the constituent structure changes as follows:

lose | the sight of NP
⇓
lose | (the) sight of NP
⇓
lose sight of | NP

At the last stage, all the constituents in their entirety have come to be idiomaticised, and are used as a single lexical structure.

This is a theoretical division, but I believe it to be faithful to the actual process that took place in the language. I will make some further points that need to be mentioned.

Have and take have been co-existent in several idioms. Presumably, have-idioms were the first to appear. In the co-existent process, the noun which follows have changes its nature from literal to metaphorical, when take begins to take the same noun.[3] For example:

(a) {have (a) / take} hold of
(b) {have the / take} advantage of
(c) {have a / take} responsibility for

As the above examples show, 'have' has a static nature and 'take' has a dynamic nature. This change from static to dynamic has been taking place up to present.

The preposition is sometimes determined by the nature of the noun which precedes it, and sometimes determined by the nature of the verb (for instance, in the case of 'give'-class idioms, which, because 'give' governs two objects, the preposition to in most cases).

'Re-analysis' plays an important role in language change. At first this has only a localised effect, but then it gradually exercises its influence on the whole. This change occurs on all levels – lexical, syntactic and semantic. Clear-cut distinctions of this kind are difficult to make, and these changes are correlated with each other.Two conspicuous factors, with all these levels taken into account, seem to stand out in particular connection with the cases under discussion.

The first factor is a tendency to move from 'concrete' to 'abstract' particularly in the case of the noun: in other words, from literal to metaphorical, although the terms do not correspond exactly. As has been pointed out, the nouns in VNP idioms are abstract ones to different degrees. The transformations which operate on them (i.e. relativisation, passivisation, etc.) can be considered as tests for eliciting the different degrees of abstractness in the nouns. From the diachronic point of view, this processis well perceived even in the limited range of this material, and furthermore, is furthered possibly by/for re-analysis. I will give some examples to support my assertion.

The process of re-analysis in the case of lose sight of is as follows:[4]

(1) lose | the sight of NP

catch
get
take
.
:

(2) lose | (the) sight of NP

(3) lose sight of | NP

In (1), sight is 'concrete' in the sense that the noun can take the and possible modification as grammatical features. The NP was in close relation with sight in the sense that the NP must be something that can be seen. In the case of the verb, there was room for choice. (2) is a transitional stage. In (3), lose sight of establishes itself as a frozen idiom. The article the disappears in the noun. The content of the NP is not necessarily an object that can be seen, as in

(a) The higher the view which men take of life, the more they lose sight of their own pleasure or interest.

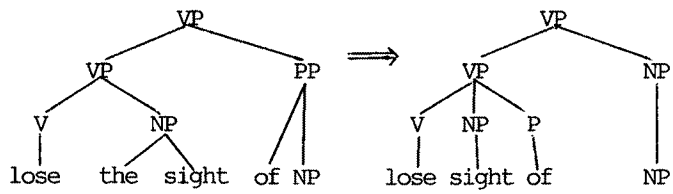
(OED Sight II 4c.1875)

The passive is also possible:

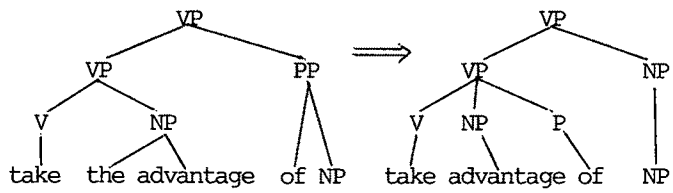
(a) The conjecture was not lost sight of by contemporary or succeeding botanists.

(OED Sight II 4c.1837)

The constituent structure changes as follows:



The analysis of take advantage of can be made similarly as follows:



{To take} $_V$ {an ill advantage} $_{NP}$ {of his absence} $_{PP}$

(OED "take" 5b.1620)

The other factor is a tendency to move from the static to the dynamic which has been apparent throughout the English language.[5] Together with some grammatical changes which took place in early modern English such as the emergence of get as a passive auxiliary, the establishment of a 'modal' category, and the increase in the so-called expanded form,[6] dynamic verbs have tended to be used for VNP idioms as in

(a) have reference to – make reference to
(b) have a fancy to – take a fancy to
(c) have pity on – take pity on

This statement implies that 'aspect' as a grammatical category has come into greater prominence as the English language has come down to the present. In the following examples, the main interest is focused on the start of the action:

(a) The Government wanted to make use of new machines in post offices.
(b) He enjoys setting fire to newly-built houses.

If the noun, adjective and verb are located on the staticness and dynamicness poles as follows

Noun	Adjective	Verb
static		dynamic

→ early English → present-day English

the static categories (noun and adjective) gradually move into the dynamic category (verb). This development in the VNP idioms, if taken as part of this process, is only a natural phenomenon. The fewer the nouns are, the more dynamic the expression is:

$$\text{lose } \underbrace{\text{the sight}}_{NP^1} \text{ of } \underbrace{NP}_{NP^2} \Rightarrow \underbrace{\text{lose sight of}}_{VP} \underbrace{NP}_{NP^1}$$

IV. Concluding remarks

I have emphasised the importance of re-analysis and the tendency of nouns to move from the literal to the metaphorical in the process of the formation of VNP idioms. These two factors cannot be considered either prior to, or posterior to, each other, but related to, and influenced by, each other. It can be further be said that the degrees of idiomaticity reflect their formative process.

Notes

* I am grateful to Mr Hugh Wilkinson and Dr Ian Littlewood for having read and made detailed comments on an earlier version of the paper.

1) It goes without saying that there are various factors at work for language changes. Samuels (1972:177), for instance, gives the following causes:
   (i) variation due to (a) inertia, and
   (b) differences of styles
   (ii) systemic regulation
   (iii) contact
   In connection with the present topic, French phrases must have contributed much to the formation of the idioms, and need to be studied separately.
2) Langacker (1977:58) defines re-analysis as "change in the structure of an expression or class of expressions that does not involve any immediate or intrinsic modification of its surface structure manifestation."
   Lightfoot (1978:78, 98-115, 129, 134, etc.) makes frequent reference to re-analysis or 're-structuring' without giving it any particular definition.
3) Needless to say, this substitution represents a tendency and several complicated factors need to be taken into consideration. One factor connected with this process is that 'take' is more agent-oriented.
3) I do not claim to explain all the 'V+ØN+P' types of idiom on this analysis. Because of the scarcity of data, not all attested the examples can be detected. In some idioms, such as take heed of and take notice of, of is considered to have been introduced later just to govern the following nouns. The nouns heed and notice were, therefore, already metaphorical.
5) I use this term in the broad sense covering aspectual changes, to which dynamic verbs react most sensitively.
6) The 'get' passive appears in 1625 (OED). As regards the modal category, see Lightfoot (ibid.:101). With regard to the expanded form, Trnka (1978:37) says "... it is in the latter half of the 16th century that it is used extensively in English." Visser (1973:1834-5) refers to the two types of expanded form such as You are being naughty and you are being a bore as modern English products.

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THE WORD ORDER OF OLD ENGLISH POETRY

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The word order of Old English poetry, unlike that of the prose, has never been completely defined, although incomplete accounts appear in the various critical editions of individual poems. In order to define the word order of the poetry, 2400 lines in 100-line segments, each segment taken from 24 major poems, were analyzed. The 100-line segment was deemed to be adequate in length, containing all the constructions that would be found in the rest of the poem. This assumption was supported by the evidence gathered from other 100-line segments from Beowulf, Genesis A, Christ and Satan, and Daniel. Comparison of these findings with those of the prose studies is only casual. A complete comparison will have to be done later.

Old English poetry is unique in that all the authors are anonymous except for Cynewulf (four signed poems), Bede (his Death Song), and Cædmon (his 9-line Hymn praising God). With the exception of the Anglo-Saxon Chronicle poems and Battle of Maldon, no other poems are dated. The poems were written between 440 A.D. and 1000 A.D, with 650-675 A.D. the earliest suggested time, and sometime shortly after 991 A.D. for the date of Battle of Maldon, the poem recording the battle that occurred then. Furthermore, for the most part only one copy of each poem is extant, most of them included in four late manuscripts which in themselves give no clue to date of composition, dialect, or author. These caveats aside, the poetry is all intelligible with only minor differences in the language of the individual poems, the major differences being in the vocabulary. Treating the poems as a single, unified body of work does not distort the data.

Old English is a transitional language, changing from OV to VO word order with the changeover completed long after the Old English period. As a result of this on-going change process, three word order types occur in the language and, therefore, in the poetry: OV, the inherited pattern; VO, the competing and eventually replacing form; and OVO, the truly transitional pattern. All patterns occur in each poem. No poem displays only one form. The patterns OV, VO, and OVO represent the patterning found in transitive clauses containing objects and intransitive clauses which have propositional adverbials occurring in the same position as do the object(s) in transitive clauses. Transitive clauses may include in addition to the object(s) the propositional adverbials of goal, source, place, direction, extent, instrument, reason, cause, purpose, and result (all represented by X below) along with the objects in the following patterns:

(a) OXV/XOV (b) VOX/VXO (c) XOVOX/XOVXO/OXVOX/OXVXO

Intransitive clauses contain no objects, only propositional adverbials selected from those listed above. Both types of clauses can contain sentential adverbials which modify the entire proposition, such as, temporal-occurrence, -duration, -frequency, -true time; locatives her, þær, and hwær; manner hu; and reason hwy. The constituent-adverbial Manner does not modify the clause proposition. It modifies either the verb or one of the proposition nominals. It is not essential to the proposition.

Four factors affect clause word order: (1) Clause type (main, subordinate, relative, imperative, impersonal, and question). No correlative clause of any type affects word order differently from its paired non-correlative clause, as is suggested in the literature. (2) Negation. (3) Verb type, transitive or intransitive. (4) The poetic requirements of alliteration and meter. (A discussion of the word order found in questions is omitted because of a paucity of questions in the 100-line segments.) Clause constituents are positioned in the clause according to the organizational patterns given above. Since in Old English the expressed subject throughout the entire period is optional, the subject is not a factor in clause typological organization.

Clause word order does not dictate in any way the word order of the individual clausal constituents making up the subject, objects, adverbials or phrasal verbs, i.e., noun phrases, prepositional phrases, phrasal verbs (the auxiliary verb(s) and the main verb). The terms NP and VP are not those used in transformational grammar, but mean only the constituents making up the subject and object noun phrases or the verbal phrases. OV patterning can occur in the clause and in one noun phrase in the clause, while the organization of the prepositional phrase and a second noun phrase can be VO and OVO respectively. The constituent word order units seem to be affected more often by poetic requirements than is clause word order. In Old English the clause organization is determined by the position of the object in relation to the verb, but not by the relation of the subject to either the verb or the object(s).

The other clause word order patterns (VSO, VOS, OSV, and OVS), all minor, seem to be the result of poetic metric and alliterative requirements in which the word order is manipulated to meet these requirements. The verb initial patterns seem to be the result of the need for alliterative matching or for metric requirements, while the object initial patterns are a matter of semantic foregrounding. When the subject is included in the clause, its placement in regard to the verb, object(s), and adverbials in these minor word order patterns seems to be due to poetic requirements and nothing else. Clause typology is determined by the position of the object in relation to the verb.

The dominant clause pattern found in each of the individual poems is OV, with the competing VO pattern a close second, and the transitional pattern OVO third in usage, except for the relative clause where almost all of them are OV in structure. The highest

number of VO clauses occurs in the main clause, with OV second, and OVO the tertiary pattern. The coordinate main clause shows the same levels of pattern type occurrence as the non-coordinate main clause. This finding is contrary to that given in the literature where it is argued that because of the Germanic heritage, the dominant word order pattern of the coordinate main clause is OV.

The imperative clause and the impersonal clause do not differ from the main clause in pattern type occurrence. The subordinate clause, whether sentence introductory or final, and irrespective of semantic type (purpose, factive, etc.) is predominately OV in structure. This is an inherited Germanic feature. There are more VO and OVO occurrences in the subordinate clause than occur in the relative clause, but a lesser number than is found in the main clause. The relative clause almost always occurs in the OV format with only a very small number of occurrence of VO or OVO. This agrees with what scholars have maintained for a longtime for both early Germanic and Old English.

Any one of the clause types discussed above can be negated. Negation changes the word order only by the addition of the negative particle ne and not by rearrangement of clausal elements. Negation does not change the basic clause word order patterns. The negative particle precedes the constituent it negates. Multiple clause elements (up to three in number) can be negated in one clause. Clause-initial ne does not act as a negative coordinate conjunction as is claimed in the grammar books. Analysis shows that it negates the entire proposition when clause initial. Considering it as a negative coordinate conjunction is an incorrect analysis based on Modern English analogues.

Clausal constituents are the same for all sentence types: subject NP, negative particle, intransitive verb and its associated propositional adverbials or transitive verb with its associated object(s), and the constituent, propositional, and sentential adverbials,all three optional in usage. The inclusion of each clause constituent is optional under certain specific constraints and conditions (discussed with each constituent so affected). A clause constituent can occur serially in a clause, just like in Modern English, and these are not appositives.

(1) gemon he selesecgas [obj. 1] ond sincþege [obj. 2]
Wanderer 34
[he remembered hall-companions and treasure-giving]

Expression of the clause constituents is optional within certain language constraints. Subject exclusion is of three kinds: the first is where the subject is simply omitted, and there is no antecedent noun for the missing subject to supply the required information.

(2) nu sculon herigean heofonrices weard. Cædmon, Hymn 1
[now shall-(we) praise the guardian of the heavenly kingdom]

Here the only indication of the subject is the plural inflection

on the auxiliary sculon. No expressed subject NP occurs in the clause, nor is there an antecedent noun to indicate what the missing subject is because this is line 1 of the poem. The second form of subject exclusion is gapping where the subject is given in the first clause of a series of coordinate clauses but is left out of the subsequent clauses because they all have the same subject.

(3) ða wearð Holofernus [subject]...on gytesalum; hloh ond hlydde, hlynede ond dynede Judith 23
[then Holofernus became drunk; laughed-(he) and bellowed-(he), roared-(he) and clamored-(he)]

Gapping may occur in any clause type with the exception of the relative clause in which the subject is relativized. However, the subject can be gapped or even omitted in a relative clause if another part of speech is relativized.

The third type of subject exclusion occurs in the imperative clause where the subject is ordinarily omitted, the preferred and dominant pattern (Ex.4, line 1). The subject of an imperative clause, expressed or not, is the "understood" you of Modern English. An antecedent noun is not necessory for this construction because the person being addressed is always in front of the "speaker" whether in real life or in a poem. The optional expressed subject can be indicated either by the use of þu (Ex.4, line 2) or outside the clause by the use of the vocative (Ex.4, line 1).

(4) Abraham leofa [vocative] ne sleah [imperative verb] ðin agen bearn ac þu [expressed subject] cwicne abregd [imperative verb] cniht [object] of ade Genesis A 2913
[Abraham dear, kill not thy own son, but you snatch the boy from the pyre alive/quick]

The placement of a subject in an imperative clause seems to be determined by whether or not the imperative clause is single, the first of a series of imperative clauses, or is a coordinate imperative clause. If the clause is a lone imperative clause or the first in a series of imperative clauses, then the subject immediately follows the imperative verb (Ex. 5, gewit). If the clause is a coordinate imperative, the subject þu immediately follows the coordinating conjunction (Ex.4, ac). Successive imperatives require that the verb be in the infinitive form even though the meaning is imperative (Ex.5, faran, lecgan) unless the final imperative in the series follows a coordinate conjunction, where the required form is the imperative (Ex.5, læde).

(5) gewit [imperative verb] þu [subject] ofestlice abraham [vocative]; faran [imperative but in infinitive form], lastas lecgan [imperative but in infinitive form]; ond þe læde [imperative verb form] mid þin agen bearn Genesis A 2850
[go you speedily, abraham; go, lay tracks; and lead with thee thy own son]

The subject is also an optional element of the impersonal clause. However, neither gapping nor plain omission occur in the impersonal clause. The change is that the subject is inserted into and not deleted from the impersonal clause. The impersonal construction originally didn't have a subject either grammatically or semantically. However, sometime after Old English the mandatory hit or it subject happened.

(6) It snowed from the north. Modern English

(7) norþan sniwde Seafarer 31
[from the north snowed-(it)]

Unlike the subject placement requirements that exist for the imperative clause, when the subject is included in an impersonal clause, its clause position is optional. The impersonal clause without a subject is the preferred and inherited form although an impersonal clause with the subject hit is the competing form throughout all of Old English. Hit is a dummy subject, has no antecedent, and no real semantic value other than to be subject. This latter pattern will become the required one after Old English when the impersonal verbs become "personal" and take ordinary subjects just like other verbs, as well as it.

(8) him on mod bearn... Beowulf 67
[ran-(it) in his mind...]

(9) ne wæs hit [subject] lange þa get... Beowulf 85
[it was not long then...]

(10) to lang hit [subject] him þuhte hwænne hi... Battle of Maldon 66
[it seemed too long to him when they...]

Verb placement in the poetry is dependent upon clause type. In subordinate and relative clauses the verb is primarily clause final, an inheritance from the earlier, parent Germanic language. In fact, only a very few actual instances of VO or OVO relative clauses occur in all the lines analyzed, even though subordinate clauses have many more of these two patterns. However, in the main clause the number of VO and OVO clauses is significantly increased over the number found in the relative and subordinate ones (for instance, in Dream of the Rood and Judith 55 per cent). The data support the argument that the changeover from OV to VO began in the main clause via OVO and slowly spread to the subordinate and relative clauses. For the prose it has been said that the subordinate, relative, and coordinating main clauses are predominantly OV in organization (Bean, 88ff.). This situation is not found in the poetry. There is no quantitative difference in the word order patterns used between initial and coordinate main clauses or initial and coordinate subordinate clauses.

Certain of the clause constituent groups have their own order separate from that of the clause. Clause nominals have their own order. If a subject is present, the ordinary pattern is for it to be SO in order, while the marked order pattern is OS. The SO order is the unmarked, inherited order. The OS order permits fulfilling poetic constraints or requirements of metrics and alliteration as well as semantic requirements such as foregrounding. In three-nominal clauses with subject, the preferred order is SIODO, also the inherited OV pattern. VO ordering of three nominals is SDOIO, the same as today, except that the IO in Old English is not a prepositional phrase as it is today in final position. The order of the genitive object and the direct object or indirect object is optional. This is also true to two accusative objects. The Bosworth-Toller Anglo-Saxon Dictionary, multiple grammars of Old English, and Visser's historical treatise on syntax often cite individual clauses which are said to have these latter objects ordered according to whether or not the object is a person or thing (dative of person, accusative of thing; accusative of person, genitive of thing; accusative of person, accusative of thing.) However, this ordering does not hold up in the actual texts althought some clauses do follow the ordering. This is more honored in modern scholarship than in the Old English poetic texts themselves.

If only subject and IO nominals occur in a clause, then the IO nominal is fronted to clause initial position in order to get a line with an unstressed word where it is needed.

(11) him [IO] þæs [reason] Liffrea [subject] woroldare [DO] forgeaf Beowulf 16
[to him, for that, God gave worldly honor]

The clause initial IO is always the unstressed dative pronoun form. The placement of the verb in the clause does not enter in on the placement of the subject and object nominals. Intervening elements do not mask which element is subject or which is object. In the unmarked order the subject is always initial. Although clause word order type is determined by the position of the IO or DO to the verb, nominal word order is determined by the positions of the nominals to each other. The verb can be placed anywhere insofar as nominal word order types are concerned. Nominal constituents do not have to be contiguous. Any of the nominals may be gapped in subsequent clauses once they have been expressed.

The reduced relative clause which functions as a Manner adverbial modifying nominals has its own word order types. It is either OV or VO, just like the other clause types. No examples of OVO were found in the data examined, but they cannot be ruled out. The constituents making up the reduced relative clause are a nominal adverbial of some kind such as Instrument or Comitative, with an optional preposition appropriate to the semantic role of the adverbial, and either an adjective functioning like a verb or a past participle .

(12) synnum [Instrument] fah [adjective] Dream of the Rood 13

[stained with sin]

(13) forwunded [past participle] mid wommum [Instrument]
Dream of the Rood 14
[badly wounded with sin]

Further word order patterns of constituents concern the noun phrase (the demonstrative, adjective, genitive and head nominal). The normal pattern for the NP is OV in organization wherein the demonstrative, adjective, and genitive precede the head noun. If the NP contains both an adjective and a genitive, one can precede the noun and the other follow it, or both can precede or follow the noun according to the alliterative pattern of the poetic line. The VO order of noun + genitive and noun + adjective is a very minor pattern in Old English. The noun + genitive pattern is eventually realized as an of-genitive in Middle English, while the adjective + noun pattern regains its dominance over noun + adjective pattern and comes down into Modern English in the OV form rather than the VO form. Genitives and adjectives can be separated from the head noun of the NP by intervening constituents not belonging to the NP.

(14) Hy [subject] þæs Lareowes [genitive] on þam wildæge word [noun head] ne gehyrwdon Christ II 458
[They the Teacher's words on that joyful-day did not disregard]

A new element in Old English, the personal possessive pronoun, assumes the same position in the NP as the demonstrative. The possessive marker inherited from the earlier Germanic is the so-called possessive dative (him, hire, hi). It is always clause initial, always a pronoun form, and is an unstressed syllable, which may explain why it continues on long after the personal possessive pronoun in the genitive increases in usage. It satisfies the same poetic demands that the clause initial IO him does.

(15) Hyre [possessive dative] þæs [genitive object] Fæder [subject] on roderum torhtmod tiðe [DO] gefremede Judith 5
[Her glorious Father in heaven made a concession for that.]

The dominant pattern of the phrasal verb is VO, one or more auxiliary verbs + main verb. The minor pattern, main verb + auxiliary also occurs, thereby satisfying poetic requirements. The verb can also be gapped, just like any other clause constituent. This gapping can be of the main verb, any one of the auxiliary verbs, or both auxiliary and main verb.

(16) hwilum ylfete song dyde [verb] ic me to gomene, ganetes hleoþor ond huilpan fore hleahtor wera, mæw singende fore medodrince Seafarer 19
[at times I used the wild swan's song for my entertainment, the gannet's cry and the curlew's music for the laughter

of men, the mew's singing for mead-drink]

The auxiliary verb wolde is gapped in the second clause along with the subject (17).

(17) oþþe mec freondleasne frefran wolde, weman mid wynnum.
Wanderer 28
[or me, friendless, would-(he) comfort, entertain with joys]

The main verb can be excluded or left out only if an auxiliary is present and the context clearly indicates that the main verb would have to be a verb of motion.

(19) þæt we to moten [auxiliary] Seafarer 119
[that we may thither (go)]

The adverbial prepositional phrase in itself is a VO feature. The use of the preposition is optional. The dominant prepositional phrase order is preposition + NP, although NP + preposition can occur to fulfill metric requirements for an unstressed syllable.

There is no hierarchical ranking of the propositional adverbials. They can be placed in any order, before or after any element in the clause according to alliteration and metric requirements. However, if two or more instances of the same propositional adverbial occur in the same clause, there is a ranking within that semantic role. The first adverbial carries the generalized meaning fitting the role. while the second adverbial is always a specific delineation of the generalized meaning, such as with her and ymbe Brunanburh.

(20) Her Æþelstan cyning...ond his broþor eac...ealdorlangne tir geslogon æt sæcce...ymbe Brunanburh Battle of Maldon 1
[Here King Æþelstan and his brother also won-by-striking eternal glory at battle at Brunanburh.]

Any adverbial may be repeated in the same clause as long as it adds new information to that given by the first adverbial. Any time a second adverbial does not add new information but only gives a variation of the original meaning, the second adverbial is an appositive added because of poetic demands. An appositive is not an integral part of the clause.

(21) Him ða [T-occurrence] Scyld gewat to gescæþhwile [T-occurrence specific] felahror feran on Frean wære
Beowulf 55
[then Scyld died at his fated time to go into the Lord's keeping]

The sentential temporal adverbials are ranked. T-occurrence þa is always given before T-frequency, T-time, and T-duration, one or all. However, there is not ranking of the latter three temporal adverbials. This ranking may well be poetic ranking and not

a linguistic ranking in that the meaning 'then', 'next', 'how' or other introductory adverbs is required to signal the furthering of the plot.

Manner adverbials differ from propositional and sentential adverbials in that they are always extra-clausal, never essential to the proposition, and only modify either the verb or a clause nominal. The manner adverbials that modify the verb are either an adverb per se, a NP in the singular dative case which could well be replaced by a true adverb (23), or a dative plural noun (24).

(22) and bæd þæt hyra randas rihte [adverb] heoldon Battle of Maldon 20
[and commanded-(he) that their shields rightly/correctly hold-(they)

(23) geseah ic þa Frean mancynnes efstan elne mycle [dative singular NP] Dream of the Rood 34
[I saw then the Lord of mankind hasten with great zeal/ zealously]

(24) wlitig is se wong eall, wynnum [dative plural NP] geblissad mid þam færgrestum foldan stencum [wynnum...stencum, a Manner adverbial reduced relative clause modifying se wong] Phoenix 7
[beautiful is all the plain, splendidly gladdened with the fairest fragrances of earth]

The manner adverbials that modify nominals are either reduced relative clauses (24 and 25) or adjectives (26).

(25) ond ic synnum fah [red. rel. modifying ic] forwunded mid wommum [red. rel. modifying ic], geseah ic wuldres treow wædum geweorðod [red. rel. modifying treow] wynnum [dative plural NP modifying scinan] scinan, gegyred mid golde [red. rel. modifying treow] Dream of the Rood 13
[and I, stained with sin, sorely wounded with sin, I saw the tree of glory honored by weeds/blooms, beautifully shine, decorated with gold]

(26) gestah he on gealgan heanne, modig [adjective modifying he], on manigra gesyhðe Dream of the Rood 40
[He mounted onto the high gallows, brave, in the sight of the many

Multiple manner adverbials of the different types and each modifying different constituents can occur in the same sentence (24,25). In (24) wynnum modifies the past participle geblissad while the entire reduced relative clause from wynnum...stencum, modifies se wong. In (25) the first two reduced relative clauses modify ic, the third and the fifth treow, while the fourth modifies scinan. Because the manner adverbials are not an integral part of the clause, they can be placed in any order and in any position in the

clause. However, they usually are placed in close proximity to the elements they modify although position can be variable according to poetic demands.

Appositives, which add no new information being only a variation of old information, can be given for the subject, adjective, genitive, object(s), and the main verb. None of the auxiliary verbs can have an appositive as to change one would give new information. The normal position for an appositive is either immediately after the restated constituent or immediately following the completed clause. Position is determined by alliterative and metric requirements.

(27) þa he mid manigeo [Comitative] com, gasta weorode [Comitative Appositive]...englum [Comitative Appositive] ond eallum ðam halgum [Comitative Appositive] Dream of the Rood 151
[when he with the many will come, with the band of spirits, with angels ond all the holy]

(28) þær wæs madma [Genitive] fela of feorwegum, frætwa [Genitive Appositive], gelæded Beowulf 36
[There was much of valuable things from far places, of decorated things, brought]

Many clauses termed in the literature to be VO or VOS in organization are really not as designated. Analysis shows these clauses mostly are lacking an expressed subject either due to gapping or exclusion, the subject being expressed on the verb. The end-placed subject is actually an appositive. Rarely does the end-placed subject occur as a true subject.

(29) hi [Subject] hyne þa ætbæron to brimes faroðe, swæse gesiþas [Subject Appositive] Beowulf 28
[they then carried him to the ocean's shore, brave companions]

(30) Genaman me þær, strange feondas [Subject Appositive],
Geworhton him þær to wæfersyne, heton me heora wergas hebban,
Bæron me þær, beornas [Subject Appositive], on eaxlum, oððæt hie [subject] me on beorg asetton,
Gefæstnodon me þær, feondas genoge [Subject Appositive] Dream of the Rood 30
[took-(they) me there, strong enemies; wrought-(they) for themselves there for a spectacle (me/object gapped); commanded-(they) me raise their criminals; bore-(they) me there, men, on (their) shoulders until they set me on a hill; fastened-(they) me there, enemies enough.]

This analysis has shown that for the poems included in the study, the dominant pattern for all clauses is OV with the replacing VO pattern occurring in 48 per cent of main clauses, in 25 per

cent of subordinate clauses but only in 3 percent of relative clauses. Each word order unit operates independently of any other word order unit: the constituent word orders operate independently of each other and of clause word order. As the 24 poems used for analysis are representative of all Old English poems, it can be predicted that when the other poems not included in this study are analyzed, their data will match the data of this study and, therefore, the findings will be the same. It is also expected that the data from the unanalyzed portion of the 24 poems will match the data from the analyzed segments, and with the same result.

The word order of a language is like the gears in a clock that govern the second, minute, and hour hands. Each time unit has its own set of gears. Each set of gears moves together at its own speed. One gear from each set meshes with the other sets in order to make the clock run. Such is the case for word order of a language and not just Old English. The second hand can be likened to the constituent word orders, the minute hand to the clausal word orders and the hour hand to the poetry.

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OLD ENGLISH SKEWING

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The purpose of this paper is to identify one area of Old English skewing (based upon the rigorous referential semantic analysis of two Old English texts: ST EDMUND, KING AND MARTYR and ST SWITHIN, BISHOP). My interest in "semantic" study began with problems encountered in translating material into non-Indo-European languages. Discourse theory has led to the answers to many of those problems, and has stimulated further semantic discourse research. The theory underlying this paper is based on certain linguistic assumptions, congenial to some of you and unacceptable to others.

Basic to this identification of Old English skewing is the assumption that every language has normal occurrences or structures, and that deviation from these UNMARKED structures can be considered "skewing". Skewing, which seems to be a universal characteristic of human language, can take many forms: permutation of surface units, deletion, the use of pro-words, lack of correlation between surface word class and underlying concept semantic domain, illocutionary skewing, passive rather than active, figures of speech, etc. This brief listing of skewing possibilities does not purport to be exhaustive, but rather is representative of devices that have been found to occur in various language families. Even when the same skewing device occurs in two languages, there is not absolute conformity in the purpose and use of the device in the two languages.

The skewing I am focusing on is the lack of normal, unmarked correspondence between semantic underlay and surface grammar. This analysis of skewing is one aspect of semantic study that attempts to objectify the result of the processing of surface grammar that goes on by a listener/reader in getting to the underlying message. This, of course, assumes a real distinction between the surface (sometimes known as surface structure) and a semantic underlay of a surface (known variously as deep structure, notional structure, etc.). The theory behind the analysis posits the complete independent clause as a basic surface communication unit, and similarly the proposition as the basic underlying semantic communication unit.

Clauses are in general surface units of predication. Typically, the explicit presence (or clear implicit deletion) of a verbal nucleus is the clue to the existence of a clause. Similarly, the predominant signal for the existence of an underlying proposition is a surface verb. However, because of semantic-surface skewing, there are many other clues to the existence of underlying propositions. These signals are language specific, but systematic within the particular language.

The proposition is considered to be the ideational core of the content of communication, and because it is the basic semantic communication unit, it is the analogue to the simple independent surface clause. Propositions contain the referential core content of a message to which nonreferential meanings may be added. This referential core content is all of the 'referential meaning', explicit or implicit, intended by an author/speaker in the surface grammar of a particular message. A single proposition consists of all of the semantic concepts (or individual meanings) intended by the original author clustered in proposition constituents and properly related to each other by intrapropositional semantic roles. Propositions are either STATE (nonoccurrences, nonevents) or EVENT (activity, or experience, or process). I have identified 5 types of STATE propositions, 14 types of EVENT propositions, and 10 constituent semantic roles. I consider the constituents of a proposition to be essentially unordered, but for the convenience of English readers they are given here in the unmarked ordering of English clauses.

In intralanguage skewing that is not grammatically conditioned, there is no one-to-one correlation between the surface and its semantic underlay. This skewing provides a dynamic overlay meaning to a basic referential meaning.

Note the following English sentences:

"John gave Mary a diamond."
"She was given a diamond (by John)."
"A diamond was given to her (by John)."
"His giving a diamond to Mary...."

According to this theory, all of these sentences, with the proper context, would have a single underlying referential proposition represented somewhat as follows:

JOHN GAVE A-DIAMOND-RING TO-MARY

They all have the same referential meaning, but they differ in what they totally communicate. Only the first

example would be the normal, unmarked, unskewed grammatical structure. The others are all examples of dynamic skewing. The second one, a passive sentence, would topicalize and thus give dynamic prominence to 'Mary', the indirect object of the first sentence. The third would topicalize and thus give prominence to 'a diamond ring', the direct object in the unmarked sentence, etc. In the perspective of this theory, this would be a TRANSFER type proposition, with "gave" fulfilling the nuclear transfer event role, with "John" fulfilling the semantic role of participant, with "diamond ring" fulfilling the semantic role of affectant, and with "Mary" fulfilling the semantic role of terminus.

Old English has several skewing devices, many of them common to Indo-European languages in general. I will give examples here of one type of Old English skewing which is of special interest in the restoration of semantic underlay: viz. nonverb surface signals for underlying propositions. A very important aspect of semantic study, but beyond the purview of this paper, would be the identification of the author's conscious or unconscious dynamic purpose for each instance of skewing. For translation, this would be followed by the identification of the receptor language's specific means of conveying each dynamic purpose of the original.

The normal, unmarked surface signal of a semantic proposition in Old English is a verb in a clause on the surface. Note the following example of the direct, unmarked correspondence between surface verb and proposition nucleus (with implicit subject):

thaet halige heafod ham feredon (St Edmund 133)
the holy head home carried-they

'they carried the holy head home'

THE-INHABITANTS CARRIED THE-HOLY-HEAD HOME

'Feredon' is the finite verb "carried" that signals an underlying proposition with CARRY as nucleus. It has the third person plural inflection, implicitly referring to previously mentioned inhabitants of that land. "Holy head" is the explicit object being carried, and "home" is the necessary location referent for a concept such as CARRY.

This example is considered to be the normal, unskewed correlation between surface verb word class and underlying semantic domain, specifically in the correlation between surface verb and underlying proposition nucleus. However, often the nucleus of a semantic proposition in

Old English is signalled by other than a surface verb. These nonverb signals result in skewing which includes abstract nouns, adjectives, adverbs, conjunctions, proverbs, demonstrative pronouns, pronouns, genitive nouns, genitive pronouns, marked modification, prepositions, stative verbs, and surface fusion.

In the following examples of analysis of Old English data, a limited Old English context is first given with the pertinent data in double quotes, with an English gloss under each Old English word, and with the location of the text data in Needham's LIVES OF THREE ENGLISH SAINTS. This is followed by an equivalence of the data being focused on, followed by a representation of the underlying restored referential proposition in caps.

--ABSTRACT NOUN--

In Old English, as in related languages (but little used by many language families), there is much reification, the nominalization of a semantic event; it takes an underlying event concept and makes it into a surface (abstract) noun.

thaet hi man wurthode and wel gelogode mid
so-that it people honored and well filled with

claenum Godes theowum to "Christes theowdome"
chaste God's servants for Christ's service
(St Edmund 211)

'Christ's service'

THOSE-PEOPLE WILL-BE-SERVING CHRIST

"Christ's service" is a noun phrase on the surface. 'Theowdome' is the abstract noun "service" which does not correspond with an underlying entity domain concept but rather with an event domain concept which signals an underlying proposition with SERVE as the event nucleus. "Christ" is the explicit object of the serving. "Those people" is implicit in the noun phrase, but restored from the immediately preceding context.

--ADJECTIVE--

Skewing between surface adjective and semantic event concept is not common in St Edmund, but does occur.

"Eadmund" se eadiga Eastengla cyninc "waes"
Edmund the blessed Eastangles' king was

snotor and "wurthful" (St Edmund 14)
wise and honored

'Edmund was honored'

PEOPLE HONORED EDMUND

'Wurthful' is the adjective "honored" which signals an underlying event proposition with HONOR as nucleus. "Edmund", the subject on the surface, is the recipient of the honor. The general tenor of the whole book indicates that it was people who were here honoring Edmund.

--ADVERB--

Occasionally a surface adverb referring to something in the external context is the clue to a semantic event and underlying proposition:

ac Crist geswutelode mannum hwaer se sotha geleafa
but Christ reveals to-men where the true faith

is thonne he swylce wundra wyrcth thurh his
is when he such miracles performs through his

halgan wide geond thas eorthan "thaes" him
saints widely around this earth for-that to-him

sy wuldor a (St Edmund 226)
be glory forever

'for that'

(because) CHRIST SO-MUCH-MIRACLIZES (may he be glorified forever)

'Thaes' is the adverb "for that" referring back to the preceding "when he such miracles performs" and signalling an underlying proposition with the event MIRACLIZE as nucleus. "Christ" is restored from the original subject of the verb "reveal".

--CONJUNCTION--

At times a conjunction seems to be the only clue to an underlying proposition:

hi eodon tha ealle endemes to tham wuda secende
they went then all together to the woods searching

gehwaer geond thyfelas and bremelas "gif" hi
everywhere through bushes and brambles if they

ahwaer mihton gemeton thaet heafod (St Edmund 119)
anywhere might to-find the head

'searching "if" they might find the head some place'

THE-INHABITANTS HOPED (to find the head some place)

'Gif' is the conjunction "if" which seems to be the only clue to the underlying proposition with HOPE as nucleus. It is not signalling a condition/consequence relationship between two propositions.

--PRO-VERB--

A pro-verb may signal an underlying proposition:

het hine tha beheafdian and "tha haethenan
commanded-he him then to-behead and the heathens

swa dydon" (St Edmund 104)
so did

'the heathens did that'

THE-HEATHEN-INVADERS LOPPED-OFF THE-HEAD FROM-EDMUND

'Dydon' is the pro-verb "did" that refers back to the fulfilling of the command to behead Edmund and signals an underlying proposition.

--DEMONSTRATIVE PRONOUN--

A demonstrative pronoun pro-word may signal an underlying proposition:

the "this" gehyrde eall (St Edmund 108)
who this heard all

'who heard all of "this"'

THE-INVADERS WERE-KILLING EDMUND

'This' is a pro-word referring back to the account of the slaying of Edmund. It is the total signal to the underlying proposition with KILL as nucleus.

--PRONOUN--

Similarly, a pronoun may be the only signal to an underlying proposition:

syththan behreowsode mid geomerunge thaet he swa
afterward repented-he with moaning that he so

rethne dom sette tham ungesaeligum theofum
cruel judgment appointed the wretched thieves

and "hit" besargode aefre (St Edmund 187)
and it regretted ever

'he always regretted "it"'

I-THEODRED HAD-SEVERELY-CONDEMNED THE-THIEVES

'Hit' is the pronoun "it" referring back to the previous recounting of Theodred's dealings with some thieves. This proposition is the semantic content of another proposition whose nucleus would be REGRET.

--GENITIVE NOUN--

A noun or name in the genitive case may be the clue to an underlying proposition:

sum swythe gelaered munuc com suthan ofer sae
a very learned monk came from-south over sea

fram Sancte Benedictes stowe "on Aethelredes
from Saint Benedict's place in Athelred's

cyninces daege" (St Edmund 1)
king's day

'in king Althelred's time'

KING-ATHELRED WAS-RULING HIS-SUBJECTS IN-985

The '-es' genitive suffix on Aethelred signals an event within a time span in regard to Athelred, and the same suffix on 'cyninces' signals the activity of Athelred at that time. The focus seems to be on the activities connected to a time span, not on Athelred's relationship as king to his people. "985", as time, is restored from external historical sources, and presumably was understood as such by the original readers.

--GENITIVE PRONOUN--

Similarly, a genitive pronoun may signal an underlying proposition:

daelan thine digelan goldhordas and "thinre
to-share your hidden goldhoards and your

yldrena gestreon" ardlice with hine (St Edmund 45)
ancestors' treasure swiftly with him

'your ancestors' treasure'

"Your ancestors' treasure" contains two genitives. 'Yldrena' would be a noun in the genitive case as in the preceding example and would have the underlying proposition:

YOUR-EDMUND'S-ANCESTORS POSSESSED TREASURE

'Thinre' in the same phrase is a genitive pronoun

signalling the proposition:

YOU-EDMUND HAVE-INHERITED THAT-TREASURE

--MARKED MODIFICATION--

Marked modification often signals an underlying proposition.

"Hingwar" ure cyning cene and "sigefaest on sae
Ingwar our king brave and victorious on sea

and on lande" (St Edmund 42)
and on land

'Ingwar has been victorious both on sea and on land'

INGWAR HAS-DEFEATED ENEMIES ON-SEA-AND-LAND

In Old English the modifier of a noun normally preceded the noun. Placing the modifier after the noun gave it a prominence that necessitates a separate proposition. 'Sigefaest' here is the third marked modifier of 'Ingwar'. 'Ure cyning' and 'cene' are the other two.

--PREPOSITION--

A preposition may signal an underlying proposition:

on tham lande waes sum man Leofstan gehaten "rice
in that land was a man Leofstan named mighty

for worulde" (St Edmund 192)
before world

'he was mighty according to the world'

PEOPLE CONSIDERED (Leofstan is mighty)

Much of skewing results from the linguistic fact that words usually have multiple senses or functions. Thus the primary function of 'for' where it collocates with a geographical concept would be the locational function of "in front of". However, it is obvious in this context that 'worulde' is referring to people, not to a geographical location, so neither location nor time (another main function of 'for') is being communicated here, but rather the meaning of "according to the opinion of", with an underlying cognition event CONSIDER.

--STATIVE VERB--

Normally, an event verb on the surface correlates with an underlying event type proposition, and a stative verb on the surface with an underlying state proposition. However, a stative verb plus a nonverb can

signal an underlying event proposition:

"he waes cystig waedlum" (St Edmund 21)
he was munificent to-destitutes

'he treated destitute people munificently'

EDMUND MUNIFICENTLY-TREATED DESTITUTE-PEOPLE

'Waes' "was" plus the adjective 'cystig' "munificent" is the clue to an underlying proposition with TREAT as nucleus.

--SURFACE FUSION--

A further type of skewing occurs when two event concepts are fused into a single verb on the surface. This results in a single surface clause representing two distinct underlying propositions:

"Eadmund cyning clypode aenne bisceop" (St Edmund 49)
Edmund king called one bishop

'king Edmund summoned a bishop'

KING-EDMUND SUMMONED A-BISHOP (come...!)
plus
YOU-BISHOP COME-TO ME-EDMUND!

'Clypode' "called" includes both the underlying communication proposition with SUMMON as nucleus, and the underlying movement proposition with COME as nucleus. It seems clear that Edmund both spoke to the bishop and also told him to move to where Edmund was. Then they together considered a future course of action.

--MODAL FUSION--

One further kind of surface skewing occurs in Old English, where two underlying propositions are signalled by one verb on the surface because of the author's specific choice of mode.

and cwaeth thaet he naefre aer naht cwethan ne
and said that he never before nothing to-say not

mihte and "baed thaet hi sungon thone gesettan
could and asked that they sang the appointed

lofsang" (St Swithin 135)
hymn

'he requested that they sang the appointed hymn'

'Sungon' "they sang" is the third person plural

preterite indicative form of the Old English strong verb 'singan'. However, normally a subjunctive form 'sungen' would follow the verb 'biddan' "request", and then a further clause with the verb in the indicative mode would express the carrying out of the requested activity. This fusion results in a series of underlying propositions similar to the following which convey all of the information intended by the original author:

THE-MUTE-BOY REQUESTED THE-SACRISTAN (may we...?)
YOU-SACRISTAN PERMIT (that we...)
WE-WOMEN-&-BOY MAY-SING THE-HYMN
THE-WOMEN-&-BOY SANG THE-HYMN

That the sacristan permitted them to sing the hymn would be part of the activity that went on, but it is signalled overtly in the surface by the author only by the fusion of mode in 'sungon'.

Skewing between languages is obvious, and is the basis for much of the difficulty we have in crossing language barriers. Intralanguage skewing is not as obvious, but an understanding of such skewing is vital to an understanding of language and communication. It helps to separate the referential semantic content from the dynamic overlay. No two languages utilize the same grammatical devices to signal an underlying semantic structure. Tying the grammatical devices of a receptor language to a restored semantic underlay provides the basis for the transference of a message to the different surface grammatical devices of the receptor language (translation being defined as the conversion of the total semantic underlay of a message in one language into the appropriate surface grammatical structure of another language).

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CONSONANT ABLAUT IN INDO-EUROPEAN

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In the second of his papers 'On certain Initial Letter-changes in the Indo-European Languages' (1846), Garnett calls attention to the interchange of b and m:

1. 'milk' Lat. lac, Welsch llaeth, blith, Gael. bligh, Gk. glágos, gála, Slav. mliek, OE meolc, etc. 'speak' Skt. brū, Av. mrū, Cz. mluwiti.

He goes on to say, with regard to these and other alternations he has discussed, that

> 'enough has been advanced to show that the scale of permutations in the Indo-European languages, as laid down by Grimm and Pott, will admit of being considerably extended beyond the limits which they have assigned' (1846.261).

Such sporadic connections of forms which differ phonologically but where no satisfactory explanation of the differences exists have been made up to the present day. A few of these are given in the notes below to show the awareness of scholars that such forms are related and that an explanation of their relationship is desirable.

Similarly, unexplained consonantal alternations had been noted in Semitic. Attention was called to some Hebrew examples by Spinoza in 1677 (1962.11). Examples from Gesenius are repeated in grammar after grammar (e.g., Nordheimer 1838.75-77 [with some discussion of IE], Gesenius 1842.44, Gesenius-Kautzsch-Cowley 1963.68). Attention is also called to 'interchanges' in the initial entry under certain consonants, such as ṭ (e.g., Gesenius 1844.363) and in lexical entries in his lexicon (e.g., ḥāmaš [1844.333]). Swadesh not only saw such alternations as very widespread in the world's languages but sought to assign meanings to them (1971; see especially 97-112, 131-34, 148-54).

Largely due to the reconstruction of proto-Chadic by Jungraithmayr and Shimizu (1981), at least a part of the large number of alternants known are now seen to fit into a series of consonant relationships which have resulted from a set of prehistoric affixes (Hodge forthcoming-a). The latter include a glottal stop, aspiration, a nasal, and gemination. Two of these, aspiration and a nasal, are clearly present in IE. This paper presents examples which show how these two prehistoric affixes are reflected in patterned relationships within the family. Extra-IE cognates are deliberately excluded here, with two purposes in mind: (1) to show that there is sufficient evidence within IE for these patterns to be recognized and utilized, and

(2) to show areas of indeterminacy where related evidence from extra-IE sources would be extremely welcome. (For examples of the broader, Lislakh [LL], relationships see Hodge forthcoming-b.)

The derivation of most IE w's from *b, demonstrated by earlier comparisons within LL, is here taken for granted (see Hodge 1981.375-77; cf. Merlingen 1982 on the labiovelars).

The basic patterns of alternation in IE are:

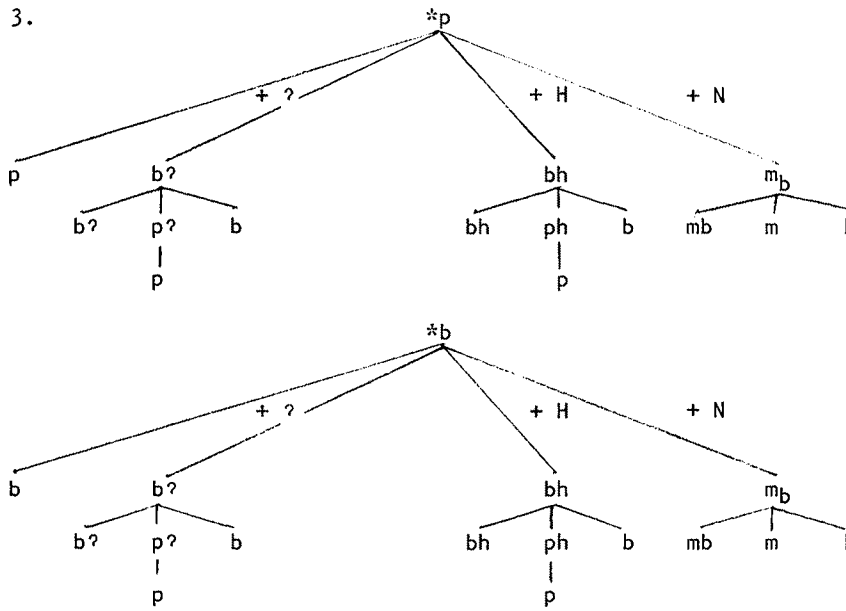
2.

Plain			Aspirated			Nasalized		
p	t	k	bh	dh	gh	mb	nd	ng
b/w	d	g						

The aspirated and nasalized series did not have voiceless/voiced contrast and reflexes may be either, as is illustrated by ph th kh in Greek and mp nt nk in various languages. Where there is a consistent reflex of a voiceless or a voiced consonant, as in Latin vincō, perf. vīcī 'conquer', tangō, perf. tetigī 'touch', one suspects either a later use of the nasal infix or analogy.

On the basis of research to date, we believe that developments of the following kind occurred, although not all of these are attested in IE. We illustrate with *p and *b:

3.



The degree of indeterminacy inherent in such developments calls for careful adherence to sound correspondences and for the utilization of all possible evidence.

The examples below show that consonant ablaut occurs with all of the stops, i.e., p t k b d g (the aspirates are derivative). As b is usually w, a Fricative column is added.

Where there is voice variation, a Voiced Stop column is used. The pattern of presentation is

4. 'Base Form F(ricative) S(top) v(oice)d S(top)
H (Aspirated) N(asalized)

Where there are derivatives of derivatives, the pattern may extend vertically. The 'base form' is a reconstruction of some pre-IE (before proto-IE) stage and consists of the root consonants only. The vowels are not as yet reconstructed, nor does it appear feasible to do so on present evidence. Both CVC- and (V)CCV- patterns occur with the same root (e.g., *gheu- 'pour a libation' and *akwā- 'water' from *k-b). It would appear that the proto-language (pre-pIE) had a root and pattern system, with variable vowels. The symbol ɾ is used in base forms as a cover for r and l. These two sounds may have been different phonemes originally, but they are so mixed in the roots as reconstructed that primacy of one or the other cannot as yet be determined.

The IE forms used are primarily those of Watkins (1973, W) and Pokorny (1959, P), with Watkins' spelling generally given preference. Reference has also been made to Bird (1982, B [reference to item number]).

5. B(ase)	F(ricative)	S(top)	H (Aspirate)	N(asalized)
5.1.1 *p-ɾ		*per- forth W 1533 (P 810)	*bhel- blossom W 1508 (P 122)	*mel- come forth P 721
5.1.2 *k-p		*kap- grasp W 1520 (P 527)	*ghabh- grasp W 1517 (P 407)	*kem- compress W 1522 (P 555)
5.2.1 *b-ɾ	*wer- burn W 1549		*bhel- shine W 1508	*mer- flicker W 1529
			*bher- bright W 1509 (P 136)	*āmer day W 1506 (P 35)
5.2.2 *k-b	*keu- bend W 1523 (P 588)		*gheub(h)- bend P 450	*(s)ka-m-b- bend W 1520 (P 918)
				*ka-m-p- /*ka-m-er bend W 1520 (P 525, 524)

	B	S	vdS	H	N
5.3.1	*t-g	*tēg- burn P 1057		*dhegwh- burn W 1512 (P 240)	
5.3.2	*p-t	*pet- spread W 1534			*pa-n-d- spread out W 1534
5.4.1	*d-ꝼ	*del- drip W 1511 (P 196)		*dhre-u- drip, crumble W 1513 (P 274)	
5.4.2	*p-d	*ped- container W 1532 (P 790)		*bhidh- pot P 153	*(s)pen- wooden pail *(s)pondho- P 989
5.5.1	*k-ꝼ	*(s)ker- cut W 1539 (P 938)		*gher- scrape W 1518 (P 439) *ghel- cut W 1517 (? P 434)	
5.5.2	*b-k	(*bak- hit P 93)	*bheg- hit P 114 break W 1508	*bhēgh- fight P 115	*bhe-n-g- P 114
5.6.1	*g-ꝼ	*ger- gather W 1516 (P 382)		*gher- grasp W 1518 (P 442)	
5.6.2	*s-g	*seg- attach P 887		*segh- hold W 1538 (P 888)	*se-n-g- P 887

Following are a few actual language examples (mostly from Pokorny) illustrating the above.

	F	S	H	N
6.1.1		Gk. pro forwards	OE blēd shoot, fruit	Gk. mb memblōka I have gone m moleîn to go (aor.)

	F	S	H	N
6.1.1 (cont'd)				b blōskō I go
6.1.2		Lat. capere take	Skt. gábhasti- hand	Latv. mp kàmpju seize
6.2.1	OChSl varĭ heat		OIr. oíbell heat	Gk. (Ion.) mb mesambríē mid-day
6.2.2	Lat. ca-cū-men summit		Ru. gibátj bend	Gk. mp kampḗ bend mb skambós crooked
6.3.1	OE ðeccan burn		Skt. dagdhá- burnt	
6.3.2		Lat. patēre be open		Lat. nd pandere spread out
6.4.1		MIr. delt dew	MHG trōr dew, rain	
6.4.2	OE fat container		Gk. píthos wine jar	Dan. nd spand bucket
6.5.1	OE scēar plowshare	Gk. keírō cut	Gk. kharássō sharpen	
6.5.2		Arm. bek broken	OHG bāga strife	Skt. n-k bhanákti breaks ON ng banga hammering
6.6.1		Gk. ageírō gather	Skt. hárati takes	
6.6.2	Skt. sájati attaches	Lith. sègti fasten	Gk. skheîn to have (aor.)	OChSl ~g segnǫti seize

Notes to the above.

7.1.1 There is also *bhel- 'swell', which Pokorny thinks may be

related (1959.122). The b of blōskō is taken to be from mb-, which is the usual interpretation. It is not due to epenthesis (*ml > mbl, so, e.g., Buck 1933.148) but represents basic *p.
7.1.2 A series kap-, ghap-, ghabh-, etc. is recognized by Pokorny (1959.528; cf. Watkins 1969.1517).
7.2.1 There is also *pol- 'burn, be warm', which Pokorny suggests may be from *(s)p(h)el- 'shine' (1959.805). If these are related to our *b-ŕ, the root would be *p-ŕ and the *b-ŕ secondary (see below).
7.2.2 Pokorny rightly compares *(s)keu- 'cover' (1959.588). We would add *kem- 'cover' (556) as an ablaut variant. He also compares *gēu- 'bend' (588); see the discussion below.
7.3.1 The reconstruction with the order *-gwh represents *-g-b plus H, with *-gbh > *-gwh. The -b is an affix, of which there is no trace in most of the reflexes of this root given in Pokorny.
7.3.2 Lat. sponda 'bedstead' fits here better than with *spen- 'wooden bucket' (Pokorny 1959.989). *bheid- 'split' (Watkins 1969.1508, P 116) is a possible aspirated form, if the shift 'split apart' > 'separate' > 'spread' can be established.
7.4.1 *del- and *dhreu- are connected by Pokorny (1959.275). An example of a base initial *d- plus N is found in Gk. andrós 'man (gen.)'. The forms we have show consonant ablaut clearly:
8. *d-ŕ 'man'. S dr-ōps (Hesychius) H + N á-n-thr-ōpos N a-n-dr-ós, a-n-ér. The -n- of anér is due to cluster simplification (-nd- to -n-). It is possible, but not probable, that drōps is from *Vndrōps, as blōskō from *mblōskō.
7.4.2 Pokorny's root for the nasal form is *(s)pondho-, from the root *spen-/*pen-. In our view the n is the result of cluster simplification, with the d part of the base form.
7.5.1 *ker- 'cut' is probably the same root as *ker- 'horn' (W 1522), as horns are believed to have been used as digging implements in early agriculture (Cottrell 1960.376, Adkins and Adkins 1982.245; I owe these references to Dr. Nancy Schmidt).
7.5.2 Two rather diverse meanings are ascribed to *bak-: 'staff (as support)' (W 1507, P 93) and 'to stick, strike' (P 93). We have chosen 'strike' as the meaning more compatible with the ablaut series, although it is less well attested (see Pokorny 1959.93). Re *bheg-, it seems unlikely that '(river) bank' is the same root as 'strike, break'. It is more probable that more than one root is involved.

The above examples are sufficient to show that the consonant ablaut series as set forth above exists in IE and offers a satisfactory basis for stating the relationship of the forms involved. There are numerous other examples, some of which are partial (e.g., *stag- 'seep' [W 1543, P 1010], *teng- 'soak' [W 1545, P 1067]), while some are more complex. The m/bh correlation, so long regarded as inexplicable, is now seen to be part of the ablaut system.

Affixes may show the same alternations, e.g.,
9. *der- 'run, walk' (W 1512, P 204)

	F	S	H	N
*-b	*dre-u- run P 204	*dre-b- walk P 204		*dre-m- run, step on P 204
Skt. drávati		OE treppan		Eng. trample, Skt. dramati
-g (-k?)		*dhre-g- pull P 273	*dhre-gh- run P 273	

There are a number of sets which show both voiceless and voiced reflexes as plain stops. For example,

	S	vdS	H	N
10.				
*k-r	*kel- call W 1521 (P 548)	*gal-/*gar- call W 1515 (P 350)	*ghel- call W 1517 (P 428)	
	*kar- praise loudly W 1521 (P 530)	*ger- cry hoarsely W 1516 (P 383)	*gher- call out W 1518 (P 439)	
11.				
*t-r	*ter- quiver W 1546 (P 1070)	*del- shake (B 313)	*dhel- (?) tremble P 246 (B 370)	
12.				
*t-k	*tek- reach W 1545 (P 1057)	*tag- touch W 1545 (P 1054)	*dheigh- knead W 1512 (P 244)	*ta-n-g- touch W 1545 (P 1054)
				*dhi-n-g(h)- touch W 1512 (P 244)
				*te-n-k- pull W 1545 (P 1067)
				*te-n-gh- pull P 1067

	F	S	H	N
13.				
*b-k	*wek-	*wəg-	*bheug-	*we-n-k-
	bend	be bent	bend	bend
	P 1134	P 1120	P 152	P 152
	(W 1548)	(W 1548)	(W 1510)	
				*we-n-g-
				bend
				P 1148
				(W 1549)
				*we-n-gh-
				be bent (?)
				P 1149

These examples raise the question as to whether k or g, t or d is the basic consonant. If one refers to the possible developments outlined in 3 above, either the voiced or the voiceless consonant could be the source. We have arbitrarily chosen the voiceless for our base. It is clear that we must have additional evidence before making any final decision, and that each case must be taken up separately.

There are many IE consonant alternations not covered by the above patterns, but enough are covered to demonstrate that the system lies back of a substantial number of IE so-called root variants. There are numerous other questions raised. If we have an independent origin for certain instances of b d g, is this the origin of these sounds in Germanic, Slavic, etc., where they correspond to Skt. bh dh gh? With the assured additional evidence from the other branches of LL we can confidently anticipate a new look for pIE phonology.

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AN ANALYSIS OF THE FUTURE TENSE IN THE EARLY GERMANIC LANGUAGES AS A MODAL CATEGORY

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0. In the following paper, I will discuss the development of the so-called future tense in the early Germanic languages in order to demonstrate that the discussion, or mere mention of future as a tense for the early Germanic languages is misleading because its syntactic development parallels that of the modal verb constructions. The reason for this syncretism between the future and modal forms may best be explained by defining the future as a modal category. Such an explanation would be more in accord with cross-linguistic evidence (as in Ultan 1978). Much of the evidence cited here will come from German sources because this evidence is as typical for all of the earlier Germanic languages as any of them would be. The other languages, e.g. Gothic, Old English, Old Icelandic, are, however, represented. Because one of the goals of this paper is to show that the future is not a tense, we will first define tense (1.1) and with it future tense. We will then briefly characterize the Germanic verb system to show its development (2.1) after which we will examine various future constructions from the Germanic languages (3.1) as well as modal constructions (4.1). Following these, we will then show that the so-called future tense does not develop like the other tenses (5.1). This development suggests that it differs from those tenses in that its primary meaning is not to convey future but rather, for example, intention and that the traditional interpretation of futuricity arises out of this primary meaning of intention.

1.1. For the purpose of our discussion, we will accept Comrie's definition (1985:9) that tense is a grammaticalized expression of location in time. Tense is furthermore a deictic category because it locates an event in time, either absolutely or relatively. By narrowing the scope of this definition so that it applies to the future, we may then arrive at the following definition for future tense: the grammaticalized expression of location in future time. The key words in this definition are grammaticalized expression which differs from lexical expression. Such instances of a lexical future may be seen in the Old High German translation of a Latin future:

OHG inti gibiris sun inti ginemnis sinan namon Heilant (1)
and you-bear son and you-call his name Savior

'and you will bear a son and will call his name Savior'

Lat. et pariēs filium et vocabis nomen eius Ihesum
(Braune/Ebbinghaus 1969:48)

The gi-prefix on the verbs -biris and -nemnis have a deictic function of pointing to the future. Even though this prefix has become bound, it was at one time an unbound particle and its reflexes throughout the Germanic languages attest to a formerly productive means of indicating futuricity lexically. Such instances, however, will not concern us here as we are only interested in those constructions which give rise to the so-called future tenses in the modern Germanic languages, namely an auxiliary verb with an infinitive complement, e.g. I will come, G ich werde kommen, Sw. jag ska komma.

2.0. Keeping in mind that we wish to see the future in light of the Germanic tense system, let us examine how the Germanic languages came to grammaticalize tense.

2.1. The Germanic languages together with the Celtic and Italic languages form a branch of the Indo-European languages which grammaticalized time distinctions in opposition to the Indo-European aspect-based verb system. Germanic opposed and grammaticized a bipartite time distinction of past and present in which present means unmarked for past. It marked its verbs in one of two ways to convey this opposition. Either the verb was marked in its root morphology by use of ablaut, e.g. Go. nima /nim-a/ 'I take' where we have the present root nim- and the ending -a for the 1st p s versus nam /nam-Ø/ 'I/he took' where we have the root for the past-singular and zero-ending for 1st/3rd p; or the verb was marked by suffixation of a dental, e.g. Go. nasja /nas-j-a/ 'I save' where we have the unmarked root nas- 'save' with the stem formant /-j-/ and the inflectional ending for the 1st p s for that class of verb versus nasida /nas-j-d-a/ 'I/he saved' where we again have the unmarked root nas- with its stem formant /-j-/, the preterite marker /-d-/, and the inflectional ending for 1st/3rd p s. Whether the opposition was marked by apophony or dental suffixation depended on whether the verb was strong or weak. The distinction between past and present, i.e. unmarked for past, is maintained throughout the verbal system.

2.2. Take as another example the case of the participles in Germanic. Germanic distinguishes between a past and a present participle. Similar to the above cases, these participles are marked by changes in root or affixal morphology. For example, OIc. nemandi 'taking' versus numinn 'taken' or OE dēmende 'judging' versus dēmed 'judged (past part.)' show the same type of opposition based on derivational morphology, typically ablaut for strong verbs and dental suffixation for weak verbs: OIc. nemandi /nem-and-i/ (from PG */nim-and-/) versus numinn /num-in-r/ (from PG /num-in-az/); OE dēmende /dēm-end-e/ (from PG */dōm-j-and-/) versus dēmed /dēm-e-d/ (from PG */dōm-j-id-/).

2.3. In the formation of the periphrastic perfect tenses, a development which chronologically parallels the formation of the future, the Germanic languages again maintained the opposition between past and present. The compound tenses were formed with an auxiliary as in OHG wesan, sīn 'to be', OHG eigan, habēn 'to have' and the past participles of a verb:

OHG ist lange quhoman 'has arrived a while ago' (2)
is long come (Behaghel 1924:271)

argangana warun 'had left' (3)
left were (Behaghel 1924:271)

habēta ubarwuntan 'had conquered'
had conquered (Behaghel 1924:271) (4)

sie eigun mir ginomanan liabon druhtin (5)
they have me taken dear lord
'they have taken my dear lord from me'
(Paul/Moser/Schröbler 1969:366)

These Old High German examples have parallels in all of the Germanic languages. The frequency of their occurrence varied and the selection of the auxiliary differed from one language to the other. All of the languages did, however, hold to the basic opposition of past versus present. The present perfect in (2) and (5) was formed with the present form of the auxiliary and the past participle while the past perfect in (3) and (4) came to be formed with the past form of the auxiliary and the past participle. In each case, it is the morphology of the auxiliary which provides the information on tense. The participle functioned as a nominal complement to the verb as seen by the inflections in the earlier stages of the languages, e.g. (3) OHG argangana warun where the final -a of argangana is a plural ending, or (5) ginomanan where the final -an ending is masc acc s in agreement with the accusative object druhtin. It is the participle which conveyed the information "completed action".

Of course, in my brief summation of the compound tense formations, I have presented a summary which may be found with greater detail in various histories and handbooks on the Germanic languages (e.g. Sonderegger 1979:95; Meillet 1970:66-88).

3.0. Against the background of these tense formations, let us now summarize the beginnings of the future formation which in modern times come to locate an event in future time.

3.1. The future is typically made in the earlier Germanic languages from an auxiliary verb with an infinitive complement and less frequently with a present participle complement. The construction with the present participle seems to be productive only in German and in any case gives way to the competing construction of auxiliary plus infinitive. Examples

with the present participle do, however, exist in other languages such as Old Swedish (see Wessén 1970:135).

The following list is not exhaustive but simply exemplary.

OHG	scal	'begin'	+ INFINITIVE
	will	'want(s)'	+ INFINITIVE

OHG miin gheist scal wesan undar eu mittem (6)
my ghost shall be among you midst
'my spirit shall be amongst you' (Behaghel 1924:259)

OHG er scal sinen druton thrato gemunton, then alten
he shall his friend very protect the old
'he shall protect his friend thoroughly, and he
satanasen wilit er gifahan (7)
devil wants he seize
will seize that old Satan' (Behaghel 1924:259)

MHG	muoz	'may'	+ INFINITIVE
	wirt	'becomes'	+ INFINITIVE
eNHG	wirdet	'becomes'	+ INF/PRES PARTICIPLE
	wil	'want(s)'	+ INFINITIVE
	sol	'am/is supposed to'	+ INFINITIVE
Go.	duginna	'begin'	+ INFINITIVE
	haba	'have'	+ INFINITIVE
	skal	'am/is supposed to'	+ INFINITIVE
	man	'want/intend'	+ INFINITIVE
OE	sceal	'am/is supposed to'	+ INFINITIVE
	will	'want(s)'	+ INFINITIVE
OIc.	mun	'will/want'	+ INFINITIVE
OSw.	skal	'am/is supposed to'	+ INFINITIVE
	varþa	'to happen, become'	+ INF/PRES PARTICIPLE

If we compare these future formations with the periphrastic tense formations, we can see that they are structurally very different:

OHG	ist quhoman 'has come' AUX-pres + PAST PARTICIPLE	vs.	scal gemunton 'shall protect' AUX-pres + INFINITIVE
OHG	habēta ubarwuntan 'had conquered' AUX-past + PAST PARTICIPLE	vs.	wilit gifahan 'will seize' AUX-pres + INFINITIVE

As we have seen, the Germanic verb is either marked for past

by vowel alternation in the root or suffixation of a dental to the root. The periphrastic perfect tenses are equally marked in their auxiliaries. The participles are always marked for past. The future which always uses the present form of the auxiliary is, if anything, not marked for past and the infinitive has no semantic time component. Let us now turn our attention to the modal verbs.

4.1. The modal verbs typically consist of those verbs represented by MHG kan 'can', darf 'need', tar 'dare', mac 'can', soll 'should', muoz 'may', and wil 'will' and their cognates in the other Germanic languages. They are typically complemented by an infinitive, e.g. OHG sorgen mac diu sela (8) worry-INF may the soul 'the soul may worry'. The infinitive complement occurs typically without the special infinitive marker, OHG zi, Go. du, OIc. at, OE tō , all meaning 'at, to'. Although the rules governing the use of this lexical marker for the infinitive are not yet fixed in the earlier stages of the languages, the modal verbs tend from the very beginning to demonstrate a close association with their infinitival complements and the complements almost never occur with this marker. Exceptions to this situation are noted, for instance, in Behaghel's Deutsche Syntax (1924:303-19). The absence of the infinitive marker conveys the close association between the modal auxiliary and the infinitive complement. The infinitive itself is morphologically a verbal noun which arose from an accusative of a nominalized verbal root, e.g. PG *beranan 'to bear'. Semantically it is time-neutral and does not fit into the past/present opposition of the participles (Behaghel 1924: 304-9, Hirt 1932:2.192-3).

5.1. If we now juxtapose the early future in 3.1 to the modal verb constructions and to the various tense formations, we find that the beginnings of the so-called future tense in the Germanic languages mirror the modal verb constructions much more closely than the tense formation. This statement can also be made for the modern languages (see for example Saltveit 1960). In fact, the fit is overwhelmingly expressed with the case of the modals in the Germanic languages. Morphologically, the tense is marked in the future constructions in the auxiliary as non-past. Syntactically, the auxiliary is complemented by a time-neutral infinitive which is expressed without the special infinitive marker. For example, compare the past and present morphology to the future morphology below.

OHG	nimu 'I take'	nam 'I/he took'
	/nem-u/	/nam-Ø/
	PRES STEM + ENDING	PAST STEM (1st/3rd s) + ENDING
	neriu 'I save'	nerita 'I/he saved'
	/neri-u/	/nerit-a/
	PRES STEM + ENDING	PAST STEM + ENDING

OHG ist quhoman 'has come' habēta ubarwuntan 'had conquered'
AUX-pres + PAST PART AUX-past + PAST PART

versus

OHG scal gemunton 'shall protect'
AUX-pres + INFINITIVE

wilit gifahan 'will seize'
AUX-pres + INFINITIVE

The past-present system has a clearly defined derivational and inflectional morphology of its own whereas the future does not. Interestingly enough, this lack of congruence between the past-present system and the future system is, according to Joan Bybee (1985:157),seen in divergent languages. The auxiliary for the future which should signal the future tense does not. It signals rather the present tense which is a good indication that we are not dealing with a grammatical future. Syntactically, it would seem most logical to assign the future to the modal categories since it does not accord with the syntactic development of the tenses in the Germanic languages. It does, however, with the modals. The case for such an assignment is further strengthened on examining the semantic sources for the Germanic future.

Upon referring to the examples in 3.1, you will notice that the semantic sources for the future auxiliary with the exception of Go. haba, G werden, OSw. varþa, and Go. duginna are all from the modal verbs. These modal verbs express intent, as in OHG will 'want(s)', obligation, as in OE sceal 'shall', or possibility, as in MHG muoz. Words of this type are common semantic sources for futures cross-linguistically. The semantics of Go. haba 'have' also fall within the scope of modality of intention as in Go. þatei tauja, jah taujan haba that which I-do and do-INF I have 'that which I do and which I will do (i.e. have to do)'. One need only consider the Romance futures which arose from just such a construction, e.g. Fr. chanterai 'I will sing' from Lat. cantare habēo sing-INF I-have 'I have (as my duty) to sing' (see Fleischman 1982). These semantic categories all serve as semantic sources for futures in languages across the world as discussed in Ultan (1978).

The examples which we have not dealt with are Go. duginna 'begin' and G werden, OSw. varþa 'to become'. These verbs both signal the beginning point of an action, i.e. they denote inchoative or ingressive aspect. This aspect is inherent to the semantics of the individual verbs and this aspect also serves as a semantic category for futures cross-linguistically, albeit not as frequently as the modals (Ultan 1978:118).

6.1. Conclusion and prospects for future investigation. From the case which I have outlined in the preceding talk, it seems that, historically, we can assign the future in the Germanic languages to a modal category. While this present

format does not lend itself to an indepth treatment of the topic, it is clear that the Germanic languages never developed a tripartite time distinction as in Lat. amō 'I love', amavī 'I loved', amabō 'I will love' but only a bipartite past-present grammatical time distinction in which the future never figured. Unlike the tenses, the Germanic future seems to have no reconstructable form in the parent language but the daughter languages all seem to produce the same types of syntactic collocations for future at varying times in their histories. Is there any genetic connection between the types in the various languages or are they semantic universal types? If they are semantic universals, as research suggests (see Ultan 1978, Fleischman 1982), then why are these types not productive until relatively late in the history of the Germanic languages?

It seems that there were lexical means of signaling future time which had been productive at one time, such as the gi- prefix in (1). Why did the types discussed in the paper, modals or ingressives plus infinitive, which in the final analysis are lexical futures, supplant or displace these previous lexical designations of future. Such lexical markers as OHG gi- are deictic but the futures which we have discussed are modal. Was there a shift of future from a deictic category to a modal one? And if so, why?

Why did the Germanic languages all of a sudden begin to produce these modal futures at around the same time? So often the impetus for their genesis is attributed to foreign influence such as Latin, Greek, or French (e.g. Behaghel 1924:258, Lockwood 1968:113). But even if influence were a legitimate explanation, what precise foreign models would serve as the source? A tenuous explanation based on foreign influences still offers no reason for this modal future which seems to be syntactically uniform throughout the Germanic languages.

These questions will constitute an outline for future inquiries into the rise of these modal futures in the Germanic languages.

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